PROJECT CHECO SOUTHEAST ASIA REPORT

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14. ABSTRACT

Project CHECO was established in 1962 to document and analyze air operations in Southeast Asia. Over the years the meaning of the acronym changed several times to reflect the escalation of operations: Current Historical Evaluation of Counterinsurgency Operations, Contemporary Historical Evaluation of Combat Operations and Contemporary Historical Examination of Current Operations. Project CHECO and other U. S. Air Force Historical study programs provided the Air Force with timely and lasting corporate insights into operational, conceptual and doctrinal lessons from the war in SEA.

15. SUBJECT TERMS

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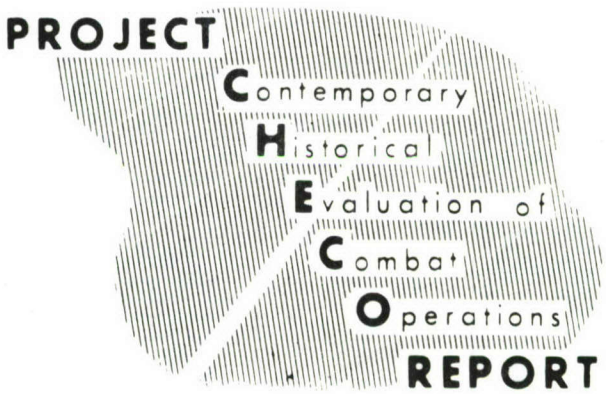

USAF SEARCH AND RESCUE
November 1967-June 1969

30 July 1969

HQ PACAF

Directorate, Tactical Evaluation
CHECO Division

Prepared by: Major James B. Overton

Project CHECO 7th AF, DOAC

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The counterinsurgency and unconventional warfare environment of Southeast Asia has resulted in the employment of USAF airpower to meet a multitude of requirements. The varied applications of airpower have involved the full spectrum of USAF aerospace vehicles, support equipment, and manpower. As a result, there has been an accumulation of operational data and experiences that, as a priority, must be collected, documented, and analyzed as to current and future impact upon USAF policies, concepts, and doctrine.

Fortunately, the value of collecting and documenting our SEA experiences was recognized at an early date. In 1962, Hq USAF directed CINCPACAF to establish an activity that would be primarily responsive to Air Staff requirements and direction, and would provide timely and analytical studies of USAF combat operations in SEA.

Project CHECO, an acronym for Contemporary Historical Evaluation of Combat Operations, was established to meet this Air Staff requirement. Managed by Hq PACAF, with elements at Hq 7AF and 7/13AF, Project CHECO provides a scholarly, "on-going" historical evaluation and documentation of USAF policies, concepts, and doctrine in Southeast Asia combat operations. This CHECO report is part of the overall documentation and evaluation which is being accomplished. Along with the other CHECO publications, this is an authentic source for an assessment of the effectiveness of USAF airpower in SEA.

Milton B. Adams

MILTON B. ADAMS, Major General, USAF
Chief of Staff

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FOREWORD

When hostilities began in Southeast Asia, the Aerospace Rescue and Recovery Service was not fully prepared to enter into armed conflict. The assumption that wartime Search and Rescue (SAR) was an extension of peacetime SAR was in error. This was quickly recognized during the early days of the conflict. In 1964, the only rotary wing aircraft available to be deployed to SEA was the HH-43B assigned to the Local Base Rescue (LBR) units. The amphibious HU-16 and the HC-54 were the only fixed-wing aircraft available. Both these aircraft had a limited rescue and recovery capability. HC-54s, made available as command and control aircraft, were also limited in mission capability. The Aerospace Rescue and Recovery Service was forced to take helicopter aircraft from other Air Force missions to provide a partially adequate SAR capability in SEA. Even then it took three years to fully develop and position the required forces.

In October 1965, six CH-3C helicopters, modified for combat rescue service, were deployed to SEA. After deployment and additional modifications, they were redesignated the HH-3E (Jolly Green Giant), and became increasingly responsible for the out-country Aircrew Recovery (ACR) mission in Laos, North Vietnam, and the Gulf of Tonkin. Twelve HH-43F (Pedros) were also configured for combat recoveries to augment the HH-43B which had been performing the out-country ACR mission since deployment in October 1964. By January 1967, HH-43 out-country missions had ended. The HC-54s were replaced by the HC-130H/P, a far more suitable aircraft for command and control.

Quick access to a downed aircrew member was a crucial element in a successful recovery, but significantly faster helicopters were years away in development. Therefore, longer endurance was vitally necessary to enable the rescue craft to loiter on orbit nearer the areas in which aircraft were likely to be lost.

Air-to-air refueling of helicopters proved technically feasible, and became a routine operation for the SAR Jolly Green Giants in September 1967, thereby greatly increasing the range and responsiveness of the SAR forces. Eight improved HH-53B helicopters, with an unofficial Call Sign, "Buff", used to designate them in this report, were procured through Priority Research Objective Vietnam Operational Support (PROVOST) action, and were deployed late in 1967. These aircraft provided greater speed and a capability to hover at a higher altitude. The evolution of SAR forces to meet combat recovery needs had been slow, and was now barely beginning to keep pace.

Since that time, significant changes have occurred to generate more effective techniques and procedures in aircrew rescues and recoveries. This report treats the organization, equipment, facilities, concept of operation, execution, and control of the vast Search and Rescue effort in SEA. Special emphasis will be placed on the urgently needed Night Recovery System that is programmed for the near future. Areas covered in the last CHECO report, "USAF Search and Rescue, July 1966-November 1967", which have not changed and are still considered as self-evident, will not be treated, unless they contribute to the continuity of this report. The following SAR Call Signs changed as of 1 June 1969:

OLD	NEW
Crown	King (HC-130P Control Aircraft)
King	Joker (Joint Search and Rescue Center)
Compress	Jack (Rescue Coordination Center)

Since the period of this report predominantly covers activities prior to June 1969, the original Call Signs will be used.

CHAPTER I

USAF SEARCH AND RESCUE, SEA

The Commander, Seventh Air Force (7AF), was delegated the Search and Rescue responsibility for the entire SEA Flight Information Region (FIR) by the Commander-in-Chief, Pacific Command (CINCPAC). The area included the Republic of Vietnam (RVN), the Democratic Republic of Vietnam (North Vietnam) (DRV), Laos, Cambodia, Thailand, Burma, and the adjacent water areas (Fig. 1). The Seventh Air Force Commander, while retaining responsibility for the rescue mission, designated the Commander, 3d Aerospace Rescue and Recovery Group (3d ARRG) as his executive agent for operational control over the SAR activity.[1/]

Third Aerospace Rescue and Recovery Group

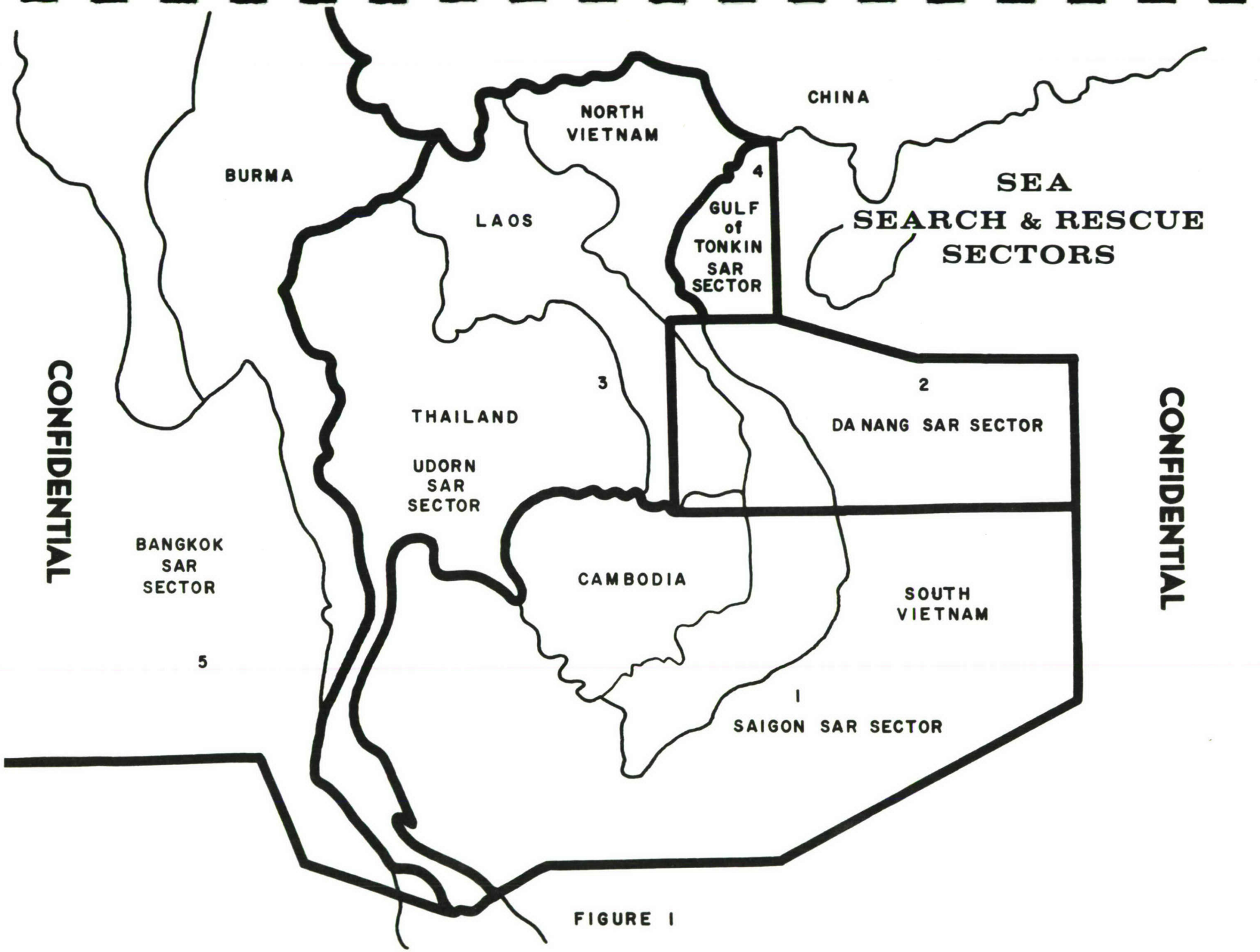
As the primary SAR Force in SEA, the 3d ARRG has the responsibility of providing a tactical force to rescue and recover personnel engaged in operations in hostile territory. To do this, the Group provides rescue units at selected bases throughout South Vietnam (SVN) and Thailand. Further, it plans, organizes, coordinates, and controls the execution of rescue operations from a Joint Search and Rescue Center (JSARC) at 7AF Headquarters and from Rescue Coordination Centers (RCCs) at selected locations.

The Commander of the 3d ARRG serves on the 7AF staff as Director of Search and Rescue (DSR). As such, he exercises operational control of all rescue forces in SEA, under the guidelines established by the Commander, 7AF. He reports directly to the Commander, 41st Aerospace Rescue and Recovery Wing, however, on command and administrative matters. The parent unit is the Aerospace Rescue and Recovery Service, which is located at Scott AFB, Illinois,

with its Major Command, Military Airlift Command (MAC).[2/]

To accomplish the far-flung SAR responsibility in SEA, the 3d ARRG exercises control over these units:[3/]

Units	Location
Joint Search and Rescue Center	Tan Son Nhut AB, RVN
Operating Location 1 (OL1) (RCC)	Son Tra AB, RVN
OL2 (RCC)	Udorn RTAFB, Thailand
37th Aerospace Rescue and Recovery Squadron (ARRS)	Da Nang AB, RVN
38th ARRS	Tan Son Nhut AB, RVN
DET 1 - 38th ARRS	Phan Rang AB, RVN
DET 2 - 38th ARRS	Takhli RTAFB, Thailand
DET 3 - 38th ARRS	Ubon RTAFB, Thailand
DET 4 - 38th ARRS	Korat RTAFB, Thailand
DET 5 - 38th ARRS	Udorn RTAFB, Thailand
DET 6 - 38th ARRS	Bien Hoa AB, RVN
DET 7 - 38th ARRS	Da Nang AB, RVN
DET 8 - 38th ARRS	Cam Ranh Bay, RVN
DET 9 - 38th ARRS	Pleiku AB, RVN
DET 10 - 38th ARRS	Bien Thuy AB, RVN
DET 11 - 38th ARRS	Tuy Hoa AB, RVN
DET 12 - 38th ARRS	U-Tapao RTAFB, Thailand
DET 13 - 38th ARRS	Phu Cat AB, RVN
DET 14 - 38th ARRS	Tan Son Nhut AB, RVN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DA NANG SAR SECTOR
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5
CAMBODIA
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1
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FIGURE 1

Units	Location
39th ARRS	Tuy Hoa AB, RVN
40th ARRS	Udorn RTAFB, Thailand
DET 1 - 40th ARRS	Nakhon Phanom RTAFB, Thailand

These widespread units, located in two nations, were responsible for search and rescue activities in an area encompassing 1.1 million square miles, extending from the Mekong River Delta to the Chinese border and from the South China Sea to the Burmese frontier. The units of the 3d ARRG, are graphically displayed in Figure 2.[4/]

Aircraft Resources

The helicopter complement of the 3d ARRG consisted of three types: the HH-3E, assigned to the 37th Aerospace Rescue and Recovery Squadron (ARRS) and also to Det 1, 40th ARRS; the HH-43 B/F, assigned to the 38th ARRS; and the HH-53B/C assigned to the balance of the 40th ARRS. The HC-130P was the only fixed-wing aircraft and was assigned to the 39th ARRS. Aircraft strength as of May 1969 was as follows:[5/]

Aircraft Type/Series	Authorized	Assigned
HH-3E	18	20
HH-43B	25	25
HH-43F	7	6
HH-53B	6	5
HH-53C	4	4
HC-130P	11	11

Both the HH-3E (Jolly Green) and the HH-53 B/C (Super Jolly or Buff) helicopters stood ground alerts and flew airborne orbits. The HH-43 B/F (Pedro) helicopters provided crash rescue/fire suppression coverage within 15 NM and an off-base aircrew recovery capability within 75 NM of the base. The HC-130P (Crown, now King) served as the Airborne Mission Control aircraft while flying airborne orbits and was used as the air-to-air refueling tanker for the HH-3/HH-53s to provide rapid reaction time. Though not assigned to the 3d ARRG, the A-1Es (Sandy or Spad) provided rescue escort (RESCORT) and fire suppression of hostile ground forces as a vital portion of the SAR effort. The SAR aircraft were deployed on a daily basis as follows:[6/]

HH-3E - 37th ARRS, Da Nang

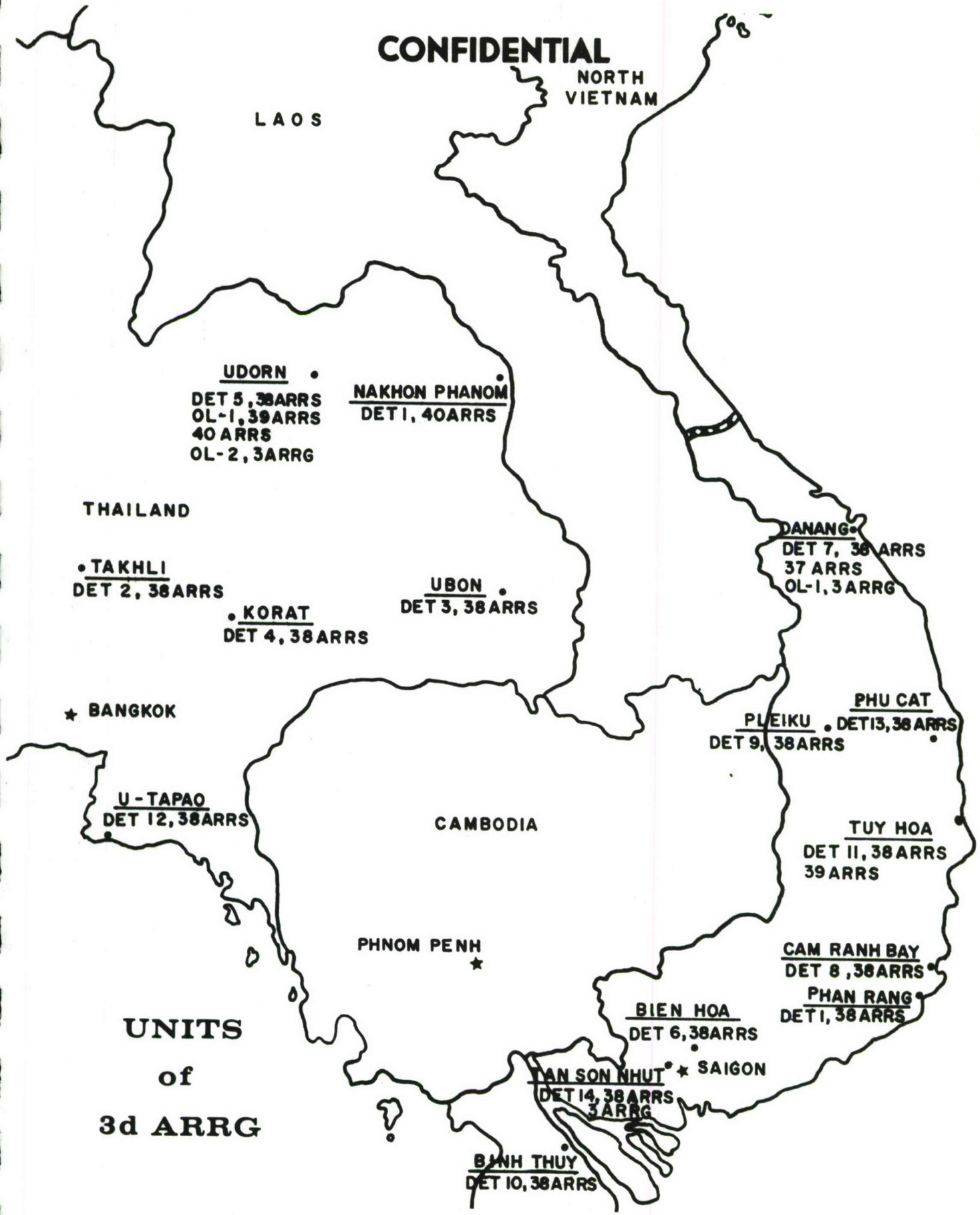
Two aircraft were on alert at Da Nang and two additional aircraft were on alert at the Forward Operating Location (FOL) at Quang Tri, just below the Demilitarized Zone (DMZ).

HH-3E (Jolly Green) DET-1 40th ARRS, Nakhon Phanom

Two aircraft were on ground alert for missions in northern and southern Laos and two flew a late afternoon orbit (as fragged) in the Central Laotian panhandle.

HH-53B/C (Super Jolly or Buff) - 40th ARRS, Udorn

Two aircraft were on ground alert at NKP as backup to the HH-3Es central orbit responsibility. Two more aircraft flew daily to Lima Site 98, alternating between ground alert and airborne orbits over Northern Laos.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NAKHON PHANOM
DET 1, 40ARRS
THAILAND
TAKHLI
DET 2, 38ARRS
KORAT
DET 4, 38ARRS
UBON
DET 3, 38ARRS
DANANG
DET 7, 38 ARRS
37 ARRS
OL-1, 3ARRG
BANGKOK
PLEIKU
DET 9, 38ARRS
PHU CAT
DET 13, 38ARRS
U-TAPAO
DET 12, 38ARRS
CAMBODIA
TUY HOA
DET 11, 38ARRS
39ARRS
PHNOM PENH
CAM RANH BAY
DET 8, 38ARRS
PHAN RANG
DET 1, 38ARRS
BIEN HOA
DET 6, 38ARRS
SAIGON
TAN SON NHUT
DET 14, 38ARRS
3ARRG
BINH THUY
DET 10, 38ARRS
UNITS
of
3d ARRG
CONFIDENTIAL

FIGURE 2

HH-43B/F (Pedro) - 38th ARRS, Tan Son Nhut

One aircraft was on a 7 day, 24 hour alert at each of 14 bases in South Vietnam and Thailand.

HC-130P (Crown) - 39th ARRS, Tuy Hoa

The Crown aircraft (1 and 2) would fly the morning and afternoon Laos orbits. Crown 3 was on ground alert at Udorn during these periods. Crown 4 and 6 would fly the overwater morning and afternoon orbits in-country, while Crown 7 stood ground alert at Tuy Hoa.

The 3d ARRG provided the coordination that was vital to the successful accomplishment of the Rescue motto, "That Others May Live".[7/]

Joint Search and Rescue Center

The Joint Search and Rescue Center (JSARC) was collocated with the 7AF Command Center at Tan Son Nhut AB, SVN. The primary purpose of JSARC was to provide coordinated direction of multi-service forces when they were involved in Search and Rescue Operations throughout Southeast Asia (SEA). The center also assured a free and unrestricted flow of information about rescue procedures and resources to all United States Forces in SEA. The center, originally located in the same building as 3d ARRG and 38th ARRS, was moved on 10 January 1968 to the 7AF Command Center. This move, by the personal direction of Gen. William W. Momyer, Commander 7AF, provided the JSARC with improved communications, intelligence, weather analyses, and information on available aircraft resources. Further, the liaison agencies within 7AF were able to gain a more comprehensive view of SAR Operations.[8/]

Because of the size of the SAR area and relatively small number of dedicated SAR forces, it was imperative that personnel and equipment from all services be made available when a SAR effort demanded it. It was obvious that any large effort should be controlled and coordinated from a central position. Although each service Commander maintained control of his forces, the JSARC, (formerly "King", now "Joker") and its subordinate Rescue Coordination Centers (RCCs), at Son Tra AB, RVN (Queen) and at Udorn RTAFB, Thailand (formerly "Compress", now "Jack") provided an around the clock operation to coordinate SAR activities, while maintaining a quick response SAR posture. When a SAR mission broke, these centers, including the Navy Center "Harbor Master" aboard a destroyer in the Gulf of Tonkin, monitored the status and movement of SAR forces, directed rescue missions through the HC-130 Crown aircraft, and thus provided the necessary command and control. According to the JSARC Chief, Lt. Col. Leslie E. Gamble: 9/

> *"We man the center with five officers, with the senior officer designated as "Senior Controller". We also use four NCO controllers and three radio operators. The radios are manned from daylight to dark or at any time the Airborne Mission Control HC-130 airport is airborne. We are involved daily in determining, from the daily frag order, where the strikes are going in, what the threat areas are, and how and when we should preposition our rescue forces to cover the areas. Since it is a "joint" center, we have an Army representative present at all times, and a Navy representative just down the hall. We send out Rescue Frags two days in advance. "Blue Chip", the 7AF Command Center, provides us with out-country aircraft resources when a mission breaks, and the 7AF Tactical Air Control Center (TACC) provides the in-country resources. Decisions at this level are made by myself as chief; the 3ARRG Commander, Col. Bridges; and of course by the 7AF Commander. We always work through the Airborne Mission Control aircraft. His communications capability will of course be*

superior to those on the ground, since he is at a high attitude and close to the action. He has all the primary radios available for use, so he can talk to everyone concerned, including the A-1E RESCORT aircraft, the fast movers, the choppers, the RCC, the JSARC, and even the survivor. Unless a mission is taking place in our immediate area of responsibility, the concerned RCC will handle it, while keeping us advised. In our area, the Saigon SAR Area, we will of course control the missions ourselves."

The designated SAR Sectors (Fig. 1) of the SEA Sub-Regions were:[10/]

Saigon SAR Sector - JSARC, Tan Son Nhut AB, RVN. South Vietnam south of 14-00N, Cambodia, and adjacent water within the Saigon FIR.

Da Nang SAR Sector - RCC, Son Tra AB, RVN. Land area bounded by 18-00, 106-00E, 14-00N, minus the northeast portion of Cambodia, and adjacent water within the Saigon FIR.

Udorn SAR Sector - RCC, Udorn RTAFB, Thailand. All of Thailand, all of Laos, except that portion east of 106-00E, all of North Vietnam west of five miles inland from the Gulf of Tonkin and minus the southern portion assigned the Da Nang Sector.

Gulf of Tonkin SAR Sector - 7th Fleet or as assigned by the Commander, 7AF.

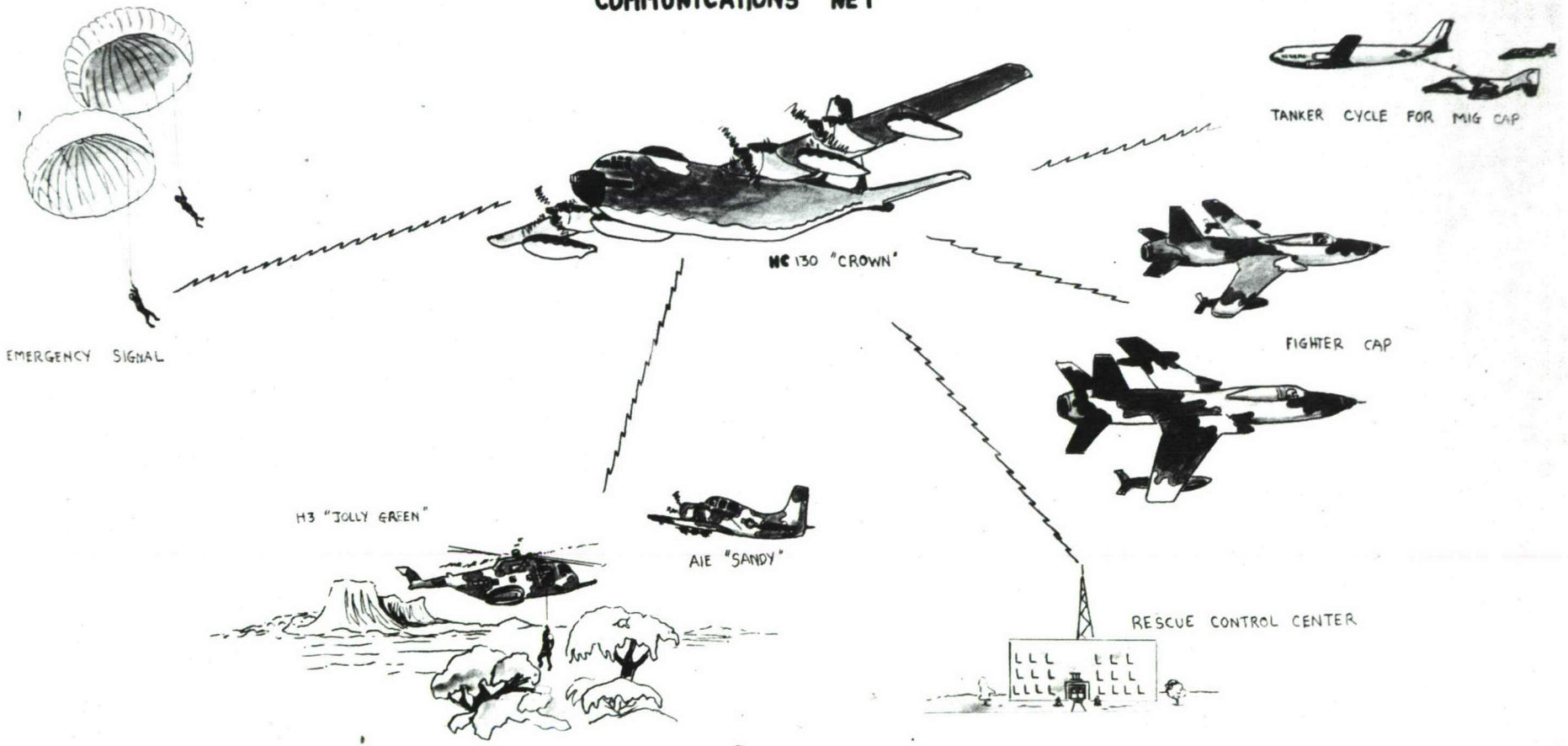
Bangkok SAR Sector - RCC at Don Muang RTAFB, Thailand. The land and water areas within the Rangoon FIR. This RCC is activated only when required.

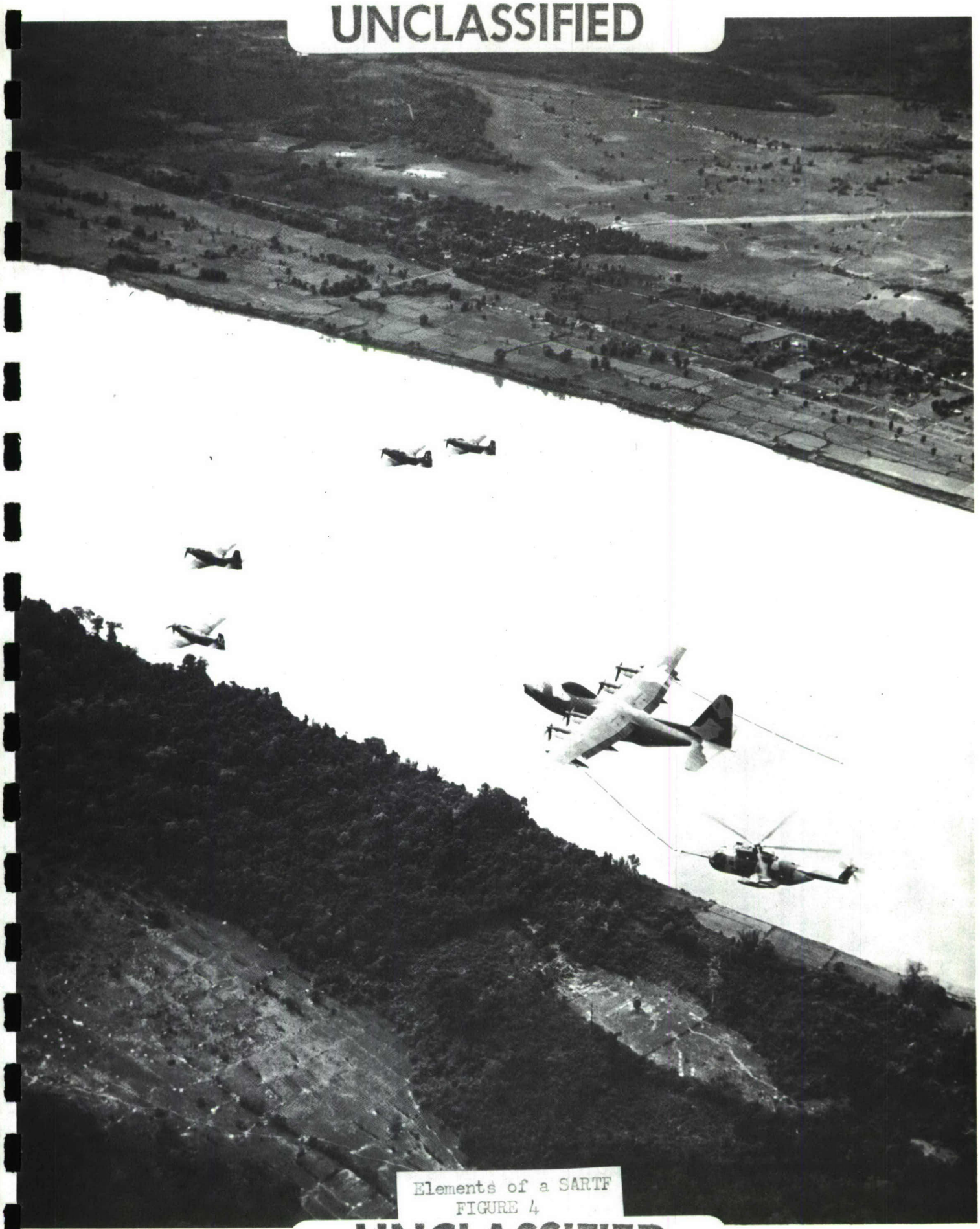
The RCCs, as SAR controlling agencies, were required to coordinate closely with the JSARC. The appropriate RCC would control the SAR forces after they arrived on the scene, while the JSARC would select the forces to be used, arrange refueling, and replace the SAR forces as necessary.[11/]

Airborne Mission Commander

The Airborne Mission Commander (AMC) was always aboard the HC-130P Crown aircraft. Crown acted as a direct representative of the JSARC and would control the SAR mission activity to evaluate mission requirements, coordinate the SAR Task Force (SARTF) activity, monitor mission progress, and most importantly, maintain the long-range communication capability for all SAR forces (Fig. 3). Additionally, Crown would appoint the On-Scene-Commander (OSC), usually an A1-E Sandy or Spad aircraft that flew low and in the immediate vicinity of the possible survivor. Obtaining and committing secondary forces, such as "fast movers" and forward air controllers (FACs), were also responsibilities of Crown. Secondary rescue resources were identified as those forces which possessed an inherent SAR capability, but whose primary mission was other than rescue.[12/]

COMBAT SAR FORCE COMMUNICATIONS NET





Elements of a SARTF
FIGURE 4

CHAPTER II

SEARCH AND RESCUE TASK FORCE

Search and Rescue is a team effort. The team concerned with Southeast Asia SAR efforts was designated as the Search and Rescue Task Force (SARTF). It was essential that all aircrews be thoroughly familiar with rescue procedures, and that all tactical aircrews be able to perform RESCAP and RESCORT functions when required. The composition of the SARTF was normally determined by the SAR mission commander in the JSARC, since he was also directing the mission. Often, however, control would be transferred to the U.S. Navy aboard the destroyer RCC "Harbor Master" when a mission involved mostly naval forces in the Gulf of Tonkin. It was even possible to transfer control to a Direct Air Support Center (DASC) for an "in-country" SAR effort, if the mission could be controlled more efficiently from that point.[1/]

To determine what aircraft could best support a specific mission, the mission commander would consider all the elements of location, weather, and known hostile forces in the area. The SARTF could be composed solely of primary forces or it could include secondary forces. Any or all of the following were considered as possible aircraft elements (Fig. 4) within a SARTF:[2/]

HH-3E/HH-53 Helicopters. (Call Signs Jolly Green and Buff). (Figs. 5, 6.) These long-range, air-refuelable helicopters were the primary recovery vehicles in I Corps, "out of country" areas, and in the Gulf of Tonkin. The HH-3E was equipped with two M-60 machine guns and the HH-53B carried three mini-guns. These guns were mounted for left and right

side firing, plus out the aft ramp on the HH-53B. The JSARC prepositioned these helicopters on forward strip alert or airborne orbit to provide maximum rescue coverage of strike aircraft. Over land areas, the helicopters normally operated in pairs, with the low helicopter making the recovery and the high helicopter providing backup capability. Over the Gulf of Tonkin, normally, only one helicopter was on orbit. Backup was provided by Navy helicopters or by helicopters at FOLs.

HH-43B/F Helicopters. The HH-43B/Fs (Pedro) were used for combat rescue missions which occurred within short distances of their air bases and, to provide backup to the Jolly Greens. They also provided a crash fire suppression capability (Fig. 7) at their operating base.

U.S. Navy Helicopters. (Call Signs Big Mother and Clementine). The U.S. Navy provided rescue helicopter coverage to support its operations in the Gulf of Tonkin and along the coastline of North Vietnam.

Rescue Combat Air Patrol (RESCAP) Aircraft. RESCAP aircraft, normally tactical strike aircraft, would form a protective shield to protect the SARTF and SAR objective from enemy action while the rescue "chopper" was en route. RESCAP was continued during the recovery operation and withdrawal of the rescue force to a cool (non-hostile) area. These aircraft would attack hostile forces attempting to capture a downed airman. RESCAP aircraft could be taken from strike aircraft in the area, or could be dispatched specifically as part of the SARTF.

Rescue Escort (RESCORT) Aircraft, A-1E/H. (Call Signs Sandy/Spad).

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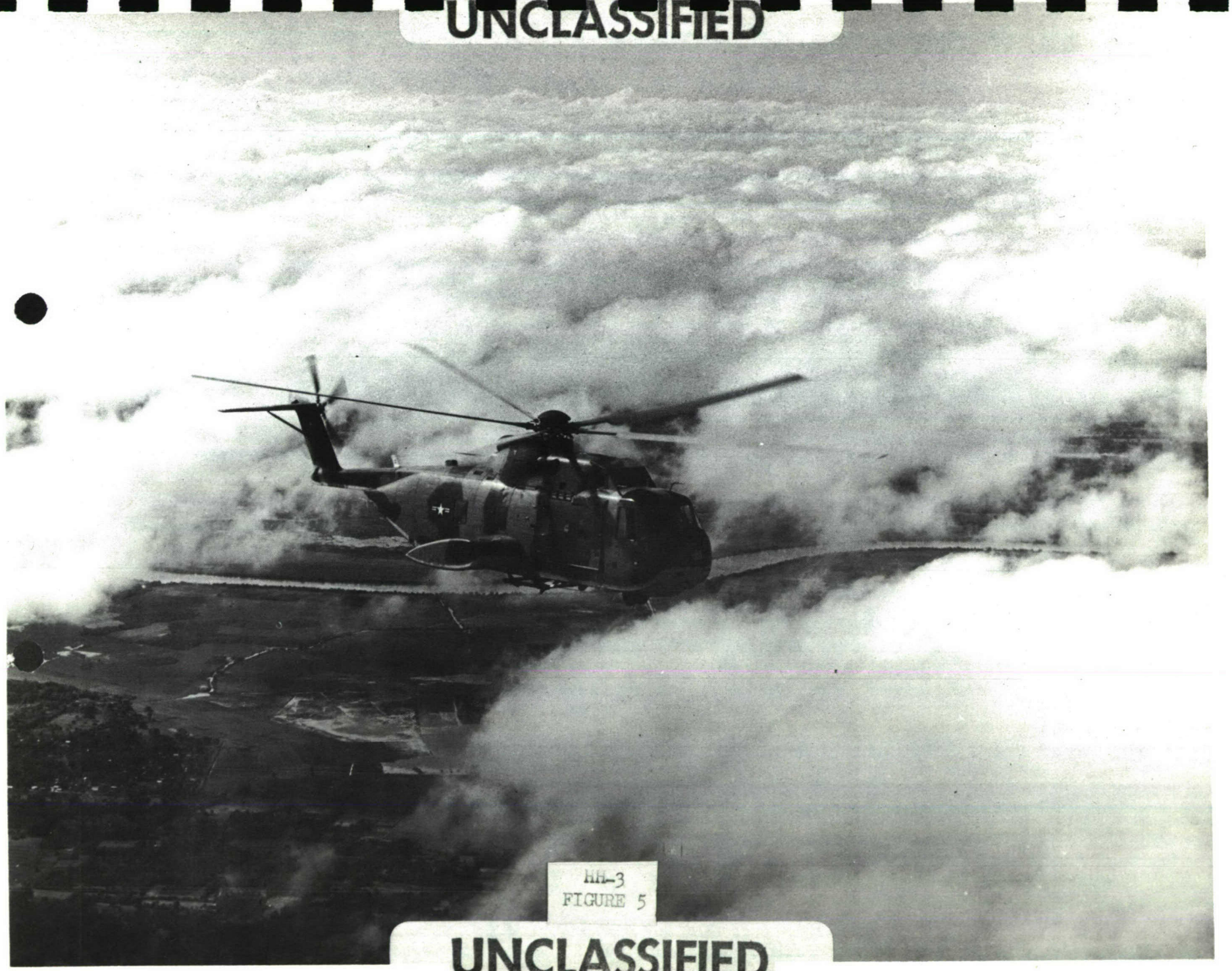

HH-3
FIGURE 5

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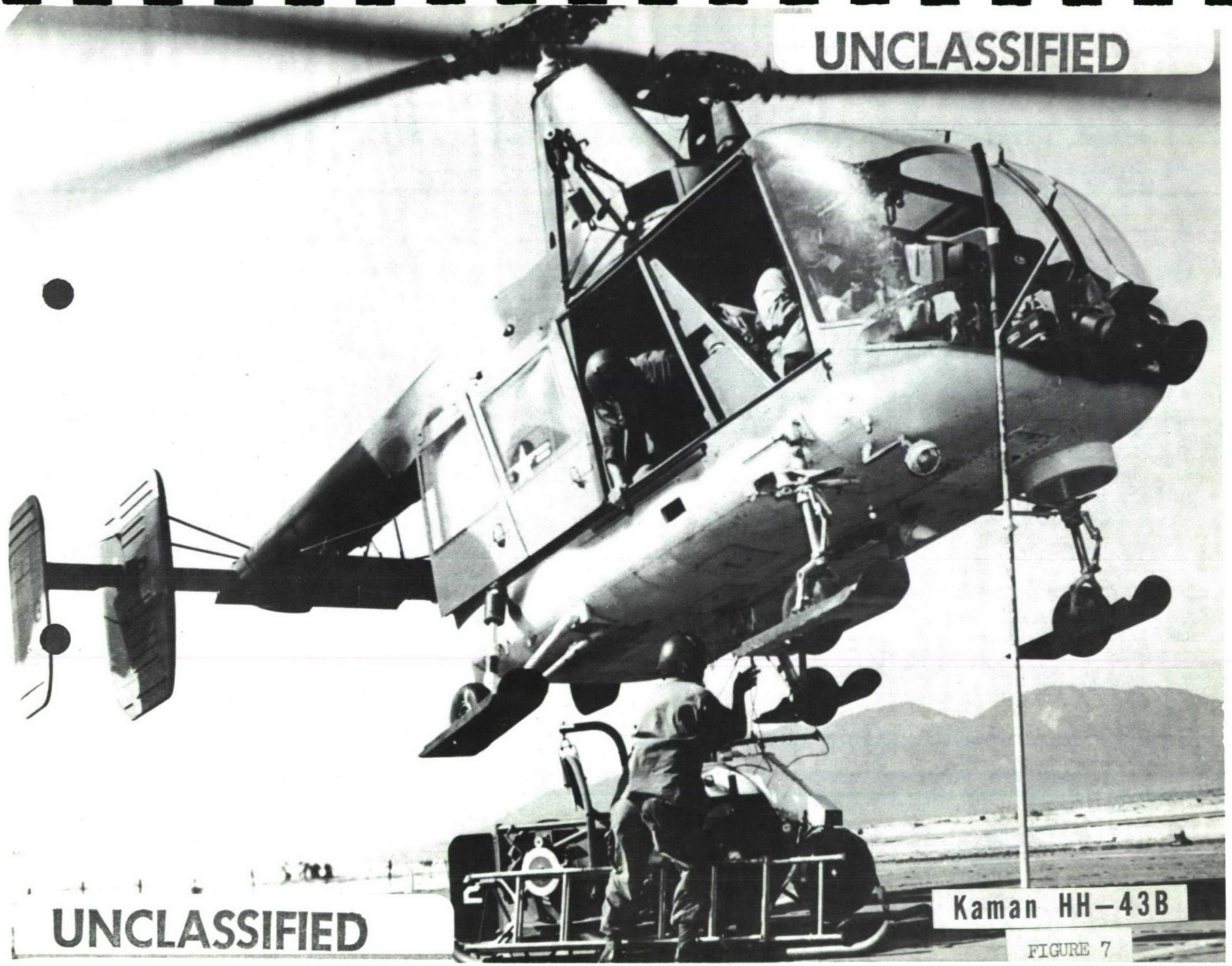
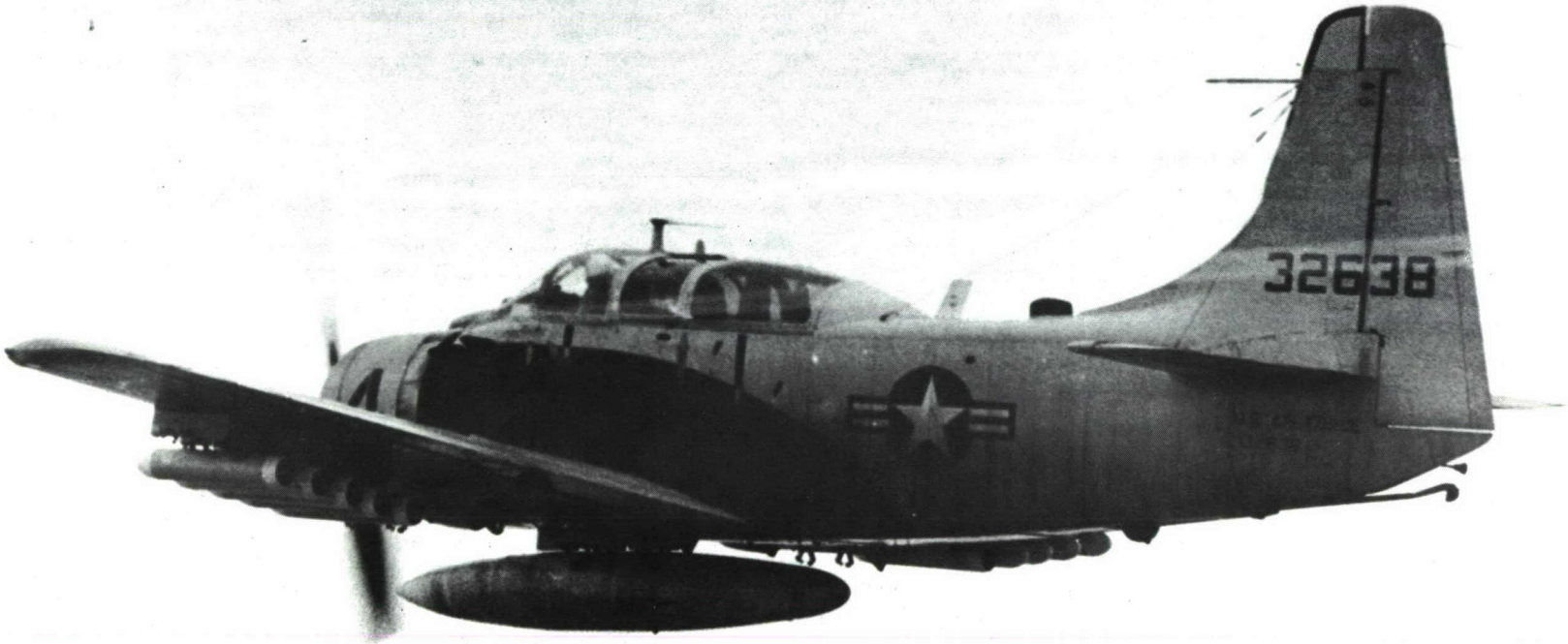
HH-53
FIGURE 6



Kaman HH–43B

FIGURE 7



A-1E SPAD
FIGURE 8

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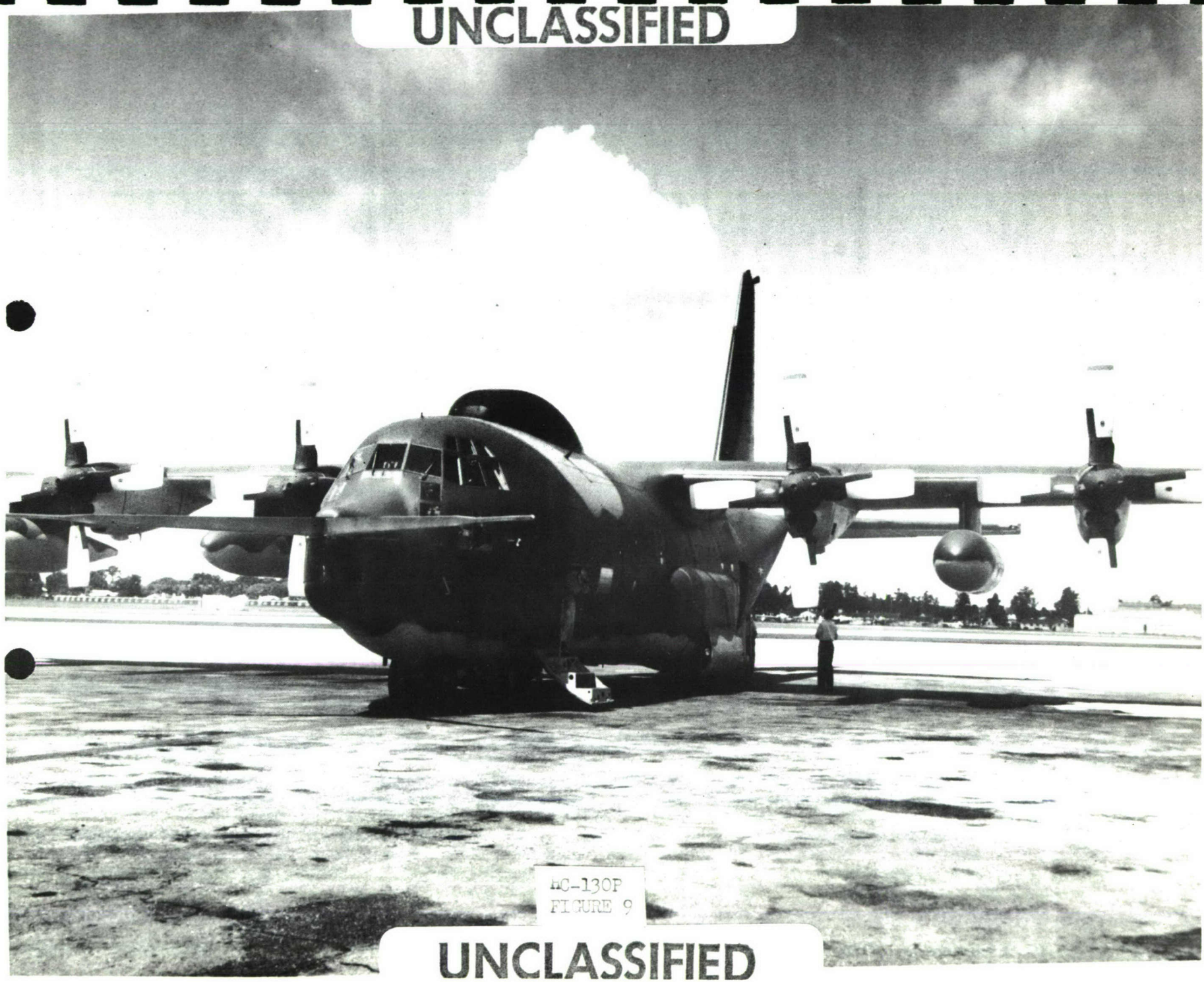

AC-130P
FIGURE 9

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RESCORT aircraft were under the operational control of the JSARC or an RCC to escort, guide, and protect the rescue heliocpter to and from the rescue scene and during the recovery operation. Additionally, armed helicopter gunships often flew RESCORT for "in-country" SAR missions, but usually RESCORT was flown by the A-1E Spad (Fig. 8).

Airborne Mission Control Aircraft. The HC-130P aircraft (Crown) was extensively equipped with electronic search and communications gear. This aircraft was capable of long-range search, long-range communications relay, and of refueling HH-3E/HH-53B recovery helicopters. The HC-130Ps were prepositioned at orbit points to allow communications to be maintained with the strike aircraft over the target areas and with the JSARC and RCCs. Crown aircraft could move from their orbit points (Fig. 9) as the mission dictated and descend for helicopter refueling as required. A condensed version of the SARTF concept of operations appears as follows: upon receiving a distress call, the agency receiving the call (Crown, RCC, or JSARC) would dispatch recovery helicopters to the scene from either airborne orbit or from ground alert position. RESCORT aircraft would be sent with the helicopters to protect them, to search for the survivor, and to suppress hostile activity. The Crown HC-130 would proceed to the area to control the activity. The mission commander at JSARC would send or divert RESCAP aircraft, provided by the 7AF Command Center or the TACC, to protect the entire SAR effort. The JSARC would insure a fully coordinated effort among all elements.[3/]

CHAPTER III

THE RESCUE MISSION

A rescue mission could be initiated by any individual having knowledge of an emergency by notifying the JSARC or one of the RCCs either directly or through another agency. The AMC, RCC, or the JSARC could initiate SAR efforts as long as the JSARC was kept informed. The SARTF would be determined by the mission commander to include primary forces and secondary forces if required. It was even possible to receive secondary support from civilian agencies such as Continental Air Services and Air America.[1/]

Prepositioning

To reduce the time/distance aspect of rescue, the 3d ARRG utilized three Forward Operating Locations (FOLs): Lima Site 36 and 98 in Northern Laos, and Quang Tri in SVN. Lima Site 36 eventually became insecure and was abandoned. In a normal procedure, there would be two HH-53s of the 40th ARRS departing from Udorn, Thailand, and arriving at a Lima Site in Northern Laos at first light. Also, two HH-3Es from Da Nang, SVN, would depart for the FOL at Quang Tri, so as to arrive at first light to sit alert. Local Base Rescue (LBR) units flying the HH-43B/F were permanently positioned at 14 SEA air bases to provide crash rescue/fire suppression and aircrew recovery capability within a 75-mile radius.[2/]

Orbit Concept

While use of the FOLs increased the rescue percentage of pickups, an even quicker response time would further increase the percentage, and so the orbit concept was conceived. In March 1969, after the arrival of four additional HH-53s, the 40th ARRS assumed responsibility for flying all the orbits in

GROUND ALERT & ORBIT LOCATIONS
HC-130 and A-1E/H

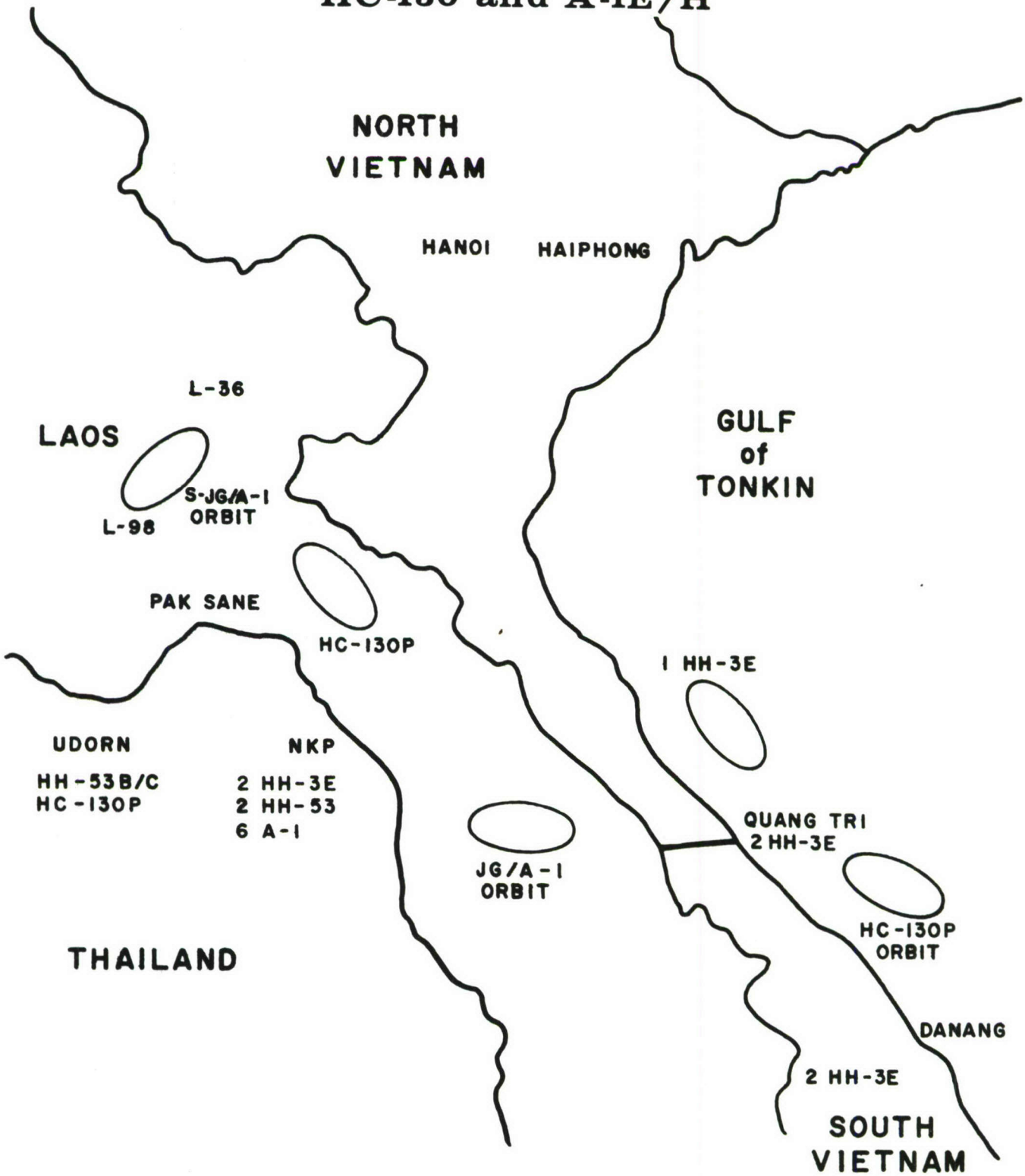


FIGURE 10

Northern Laos. They also provided two aircraft on standby alert at Udorn 24 hours a day. Det 1, 40th ARRS, at Nakhon Phanom provided a primary alert posture at the home base, and flew the orbits over Central Laos. The 37th ARRS maintained the ground alert posture at Da Nang and Quang Tri, and flew the orbits over the Gulf of Tonkin during periods of heavy reconnaissance over North Vietnam. Figure 10 portrays the ground alert and orbit locations.[3/]

The HC-130P Airborne Mission Control/Tanker aircraft were also prepositioned on orbit locations over the Gulf of Tonkin and along the Laos/Thailand border on a daily basis. The orbit positions were designated according to the planned strike areas for the day. The A-1E/H RESCORT aircraft (discussed in Chapter V) were located on strip alert and on orbit as near as possible to the helicopters on alert/orbit, to best perform their role of helicopter protection. The alert/orbit locations of the HC-130, as well as the A-1E/H aircraft are shown in Figure 10.[4/]

Classification of Urgency Phases

There were three phases of urgency established for possible SAR efforts. These were:

- Uncertainty Phase - involved overdue aircraft or position reports that required a preliminary communications (PRECOM) search and the alerting of SAR forces.
- Alert Phase - involved overdue aircraft, disabled aircraft, or apprehension for the safety of an aircraft or its occupants; it required an extended communications (EXCOM) search, finalized

search plans, assembly of SARTF components and the possible dispatch of an aircraft for route search.

- Distress Phase - involved the certain knowledge that an aircraft was missing, in distress, or in danger and required the launching of SAR forces. Combat rescue missions were almost always in this category and generally were initiated by wingman reports, distress/bailout calls, or emergency beeper signals.[5/]

Launching of SAR Forces and Mission Control

Launching of the SAR forces and control of the rescue mission were described in Chapter I, with the added requirement of obtaining "Border Clearance" from the Commander, 7AF, if necessary, to enter North Vietnam. The RCC was the lowest echelon of control that could commit SAR forces to an off-base rescue mission. LBR units' operational control commanders and JSARC clearance was required if they were to be involved in a rescue mission off base.[6/]

Mission Closure/Suspension/Withdrawal

When it appeared that all reasonable actions had been completed, the JSARC would recommend to the Commander, 7AF, that the mission be suspended. The AMC or the OSC could temporarily withdraw the SARTF, if the considerations of weather, enemy action, or terrain dictated it. The JSARC could close a mission completely when: (1) the recovery was completed; (2) the position of the survivor was positively identified, but there could be no further value in the continued use of the SARTF (required Commander, 7AF, approval); (3) there was no indication of need for SAR effort; (4) recovery was extremely doubtful due

to hostile activity, probable capture, or time lapse (required Commander, 7AF, approval); and (5) the mission proved to be false.[7/]

CHAPTER IV

RECOVERY VEHICLES AND PROCEDURES

The helicopters, as the primary USAF recovery vehicles, were developed to rescue downed airmen under almost all imaginable conditions. Men were plucked from deep, triple-canopy jungles, the sides of steep karsts, water, rice-paddies, the tops of trees, damaged aircraft, and from head-high elephant grass. More often than not, hostile fire was encountered during the attempts. (Figs. 11-14.)

Recovery Figures

From 1965 through May 1969, the HH-43 Pedro made 869 combat recoveries to lead all helicopters. The figure is somewhat misleading since the Pedro was involved in LBR work, and thus was utilized to recover airmen bailing out of damaged aircraft fairly close to base. The HH-3 Jolly Green Giant followed with 674 combat saves, doing its work from 1966 to the present, but effecting the deep penetration recoveries that were so vital during action in North Vietnam. The HH-53 Super Jolly or Buff (Big Ugly Fat Fellow) began its mission late in 1967, and as of June 1969 had effected 117 combat recoveries. As the latest, fastest, and best armed helicopter in SEA, it was able to proceed to practically any combat area to recover downed airmen. Both Jolly Greens were air refuelable and, as discussed earlier, were capable of rapid reaction time while on FOL ground alert and while flying orbit alert. The HU-16, a fixed-wing aircraft, made 47 water recoveries but was not used after 1967.[1/]

Pararescueman Exits HH-3
FIGURE 12

HH-3 Flight Engineer operates hoist
FIGURE 13

Pararescueman rides Forest Penetrator down through Trees
FIGURE 14

Training

Training for the Jolly Greens was the responsibility of the Aerospace Rescue and Recovery Training Center (ARRTC), formerly the 48th ARRTC at Eglin AFB, Florida. The length of the course was eight weeks, with each student flying between 50 and 75 hours while receiving a minimum of 28 flights. The purpose of the training was to groom pilots specifically for operations in SEA. They received every conceivable type of instruction, including day and night instrument training, transition, land and water hovering, hoist and sling operation, air refueling, high altitude work, and gunnery missions.[2/]

According to Maj. John E. Duffy, HH-53 instructor, at Eglin:[3/]

> *"All the instructors here are SEA returnees, so a large part of our instruction involves 'lessons learned.' We even have missions into the mountains of Tennessee to do 'Forest Penetrator' and mountain work. The area we work in resembles many of the SEA areas. We work on the principle that the more realistic we can make the student's training, the quicker they will become 'combat-ready' after arriving in SEA. The HH-43 training is done at Sheppard AFB in Texas."*

There was no way, of course, to train a man completely, prior to his arrival in SEA. All SEA units had programs of training to assure that new crewmembers were thoroughly qualified before flying as combat crewmembers.

The Pedro

The HH-43B/F was the helicopter having the longest service in SEA. The LBR responsibility was an important one. The Pedro capability was explained well by Maj. Charles Trapp, Jr., Commander, Det 5, 38th ARRS, at Udorn Air Base, Thailand, when he said:[4/]

"We are said to be tied to the flagpole of the base where we work. The Pedro (H-43) is a fine chopper for base support and our primary mission is to handle emergencies that happen within a 75-mile radius of the base. But lest anyone think that we are not involved in combat saves, a check of the records will prove that the Pedro has effected more recoveries than any other type chopper. Of course, there are more Pedros in the inventory. We stay on 24-hour alert and have available the Fire Suppression Kit beneath the bird that has saved many a damaged aircraft from burning. Before the bombing in the north stopped we were involved in an average of 50 emergencies a month. It's less now of course, but still runs around 30 a month. Generally we carry a pilot, medic, and two firemen aboard for day missions. At night we take off the firemen and add a co-pilot, a flight engineer, and a Pararescueman. We feel that the H-43 has many advantages. We don't have the endurance, the lift capability, or the firepower of the big birds, but we do resist battle damage well because of presenting a small target. We're not power limited (power to weight) as the big boys are, and of course we can get into tighter places. We have other limitations, however. Our navigation equipment is less sophisticated so our weather capability suffers. Additionally our chopper pilots arrive with no official combat training--so they learn as they go. Further, when we go out there are rarely any Sandys (A-1Es) for support. Actually we get a good deal of support from the Army gunships."

The following is a chart of the performance figures of the Pedro:

HH-43B		HH-43F
4	Crew	4
75 Knots	Speed	75 Knots
75 Miles	Radius of Action	75 Miles
2+20	Endurance	2+20
None	Armament	None
None	Armor	Yes

HH-43B		HH-43F
210	Hoist Capability (ft.)	210
UHF	Communications	UHF-VHF-FM
ADF + UHF	Homer	ADF + UHF

A typical Pedro LBR mission was described by Maj. Lester B. Langston, Operations Officer of Det 5, 38th ARRS, Udorn AB, Thailand, as follows: 5/

> *"I was the alert pilot on duty when we received notification at 0915Z, by Compress, that an F-105 had suffered battle damage and was approximately 70 miles out and proceeding to Udorn. We launched at 0917Z in our Pedro and as we approached the orbit area my medic observed the pilot eject. He was having control problems. We followed the chute as it descended and it hit the ground about 300 meters from our position. I made a decision to land rather than attempt a pickup since the pilot was observed to be up and walking around. I experienced high winds and had to make a rather steep approach to clear some tall trees in the area. I sent the Rescue Specialist and the Fire Specialist to recover the pilot. I then took off in slow flight to direct them to the survivor's position. He was in a heavily wooded area. My men reached him, gathered up his gear and led him out of the wooded area back to the open spot where I picked them all back up. The pilot only had some minor facial injuries. We landed back at Udorn at 1002Z and turned the pilot over to a waiting ambulance. So 47 minutes from notification, and 32 minutes after ejection, the survivor was back at his home base. This is the type work the Pedro is best suited for. This combat save, and it was that, was effected in a minimum of time, at a minimum cost, and in a safe manner."*

Jolly Green Giant and Buff

The Sikorsky HH-3E--Jolly Green Green Giant--and the larger Sikorsky HH-53B/Cs, Buffs (Fig. 15), were the backbone of the SAR effort in SEA. The Jolly Green capabilities were extensively covered in a previous CHECO report,

so they will not be detailed here. But the primary differences can be noted between it and the newer Buff. The Buff was about 30 knots faster and could fly in a larger envelope, though the Jolly Green had slightly longer endurance because of the lower power to fuel ratio. Further, the HH-3 was restricted to about 4,000 feet "hovering" altitude, whereas the Buff could hover up to 6,500 feet. This was considered a decided advantage when working in mountainous areas. In fact, according to Maj. John Duffy: "Hovering and high altitude work is a different ball game--the birds just don't handle the same." Then also, the "single engine capability of the H-53 is very good--many have returned with extensive battle damage, yet with all major systems still working."[6/]

A comparison of the performance figures of the two aircraft can be seen in the following chart:[7/]

JOLLY GREEN AND BUFF

HH-3		HH-53
4	Crew	5
110 Knots	Speed	140
310 Miles - w/o AR	Radius	290 Miles - w/o AR
Unlimited - w/AR	Endurance	Unlimited - w/AR
2 M-60 Guns	Armament	3 Mini-Guns
Yes	Armor Plate	Yes
240	Hoist Capability (ft.)	240
UHF, VHF, HF, FM	Communications	UHF, VHF, HF, FM
ADF, UHF	Homer	ADF, UHF

UNCLASSIFIED

HH-3 takes on Fuel while HH-53 stands by
FIGURE 15

The Buff also had a greater lift power. As Lt. Col. Chester Ratcliffe, Commander of the 40th ARRS, said, "Something not mentioned often is the unusual lift power of the HH-53B. One lifted an A-1E weighing 12,000 lbs., from a position 56 miles southeast of NKP, and carried it back there. Another one lifted and carried a Huey chopper weighing 5,700 lbs., fifteen miles to Lima Site 36. The C model can develop nearly 800 more shaft horsepower, and has a lift capability of 15,000 lbs., as opposed to the 12,000-lb. lift capability of the B model."[8/]

The Buff mission was a busy one, involving the entire responsibility for the Laos northern orbit. Two HH-53s were put on orbit each day, in the Site 98 area. One Buff was kept on ground alert at Udorn to back them up. Two more were put on ground alert at NKP as backup to the central orbit mission. The orbit concept of operations began in August 1968, primarily to reduce reaction time. It also had the additional benefit, after a short time, of putting the Rescue Crew Commander (RCC) (Helicopter Aircraft Commander) in a similar atmosphere to that of the aircrewmen in trouble.[9/]

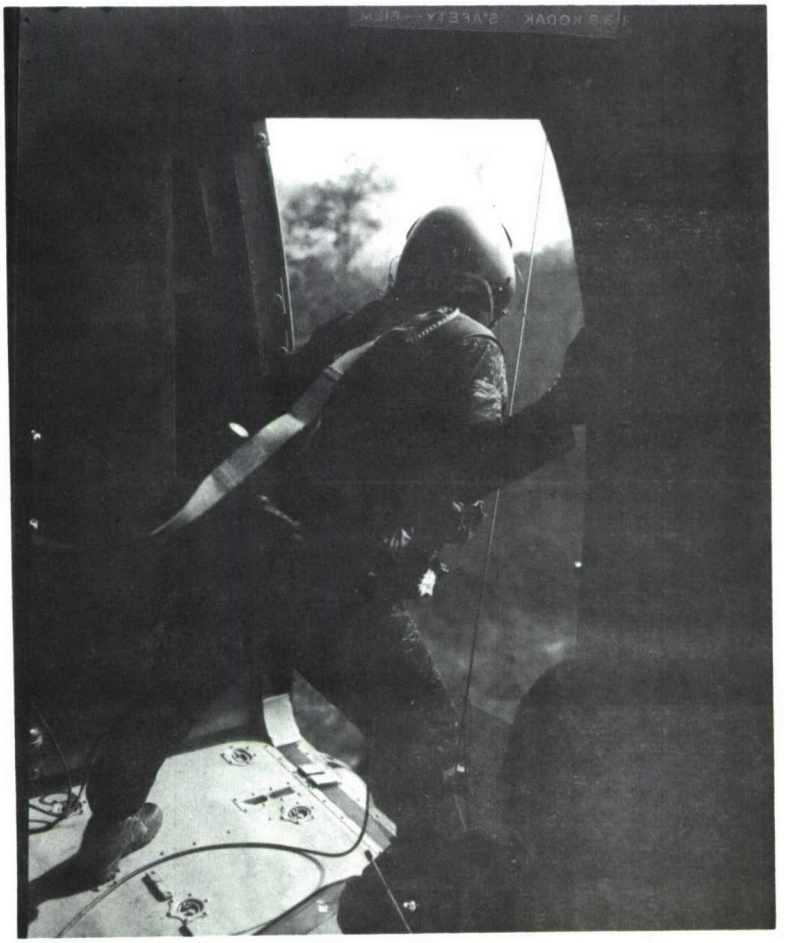
The normal day of a Buff crew flying the northern orbit is a strenuous one. Capt. Art Smith, RCC, 40th ARRG at Udorn Air Base, Thailand, narrates a typical day's work:[10/]

> *"Flying the northern orbit makes for a fairly full day. Generally, all the crews get up at about 0330 hours and proceed to the officers' club for breakfast, return to the line at 0445 hours to draw equipment and attend briefing. We takeoff in the Super Jolly for Lima Site 98 at 0600 and arrive there at 0700. We then sit ground alert, fueled, armed and ready to go on a moments notice. Actually*

from notification it generally takes from 5 to 15 minutes to become airborne. There are always two Buffs there--one to fly high and one low. Usually, if we haven't been scrambled earlier, we will fly to orbit position around noon for the fragged part of the mission, lasting from two to three and one half hours if no emergency occurs, and of course any number of hours if one breaks. When orbiting, both birds fly between eight and ten thousand feet. Lower perhaps if the cloud cover presents a problem because we have to see the area we're patrolling or we must observe strikes in progress if possible. If a mission breaks (an emergency) the low bird is alerted by the OSC and eventually called in while the high bird stands by at altitude as a backup in case anything happens to the low bird. There is also another backup bird sitting ready on ground alert back at Udorn that can be deployed on a moment's notice. We will often refuel from the Crown HC-130 while on orbit duty, depending, of course, on what we have to use. We usually are always up as sundown approaches as this seems to be a high strike activity period. When a mission breaks of course there is no set procedure; we follow the orders of the OSC up to a point, then thereafter make our decisions in concert with the OSC according to the way the situation develops. I really feel that the present concept is the most efficient we have had, but only if the Sandys' (A-1E) support is continued. We fly back to Udorn after sundown and what with debriefing, turning in equipment, etc., it makes for a pretty long day."

The HH-53s employed in the combat aircrew recovery role (they were sometimes involved in other missions), carried a crew of five and had the capability to carry more than 60 combat troops. A rundown of the position and responsibilities is presented as follows: 11/

Rescue Crew Commander. (RCC, hereafter referred to as Aircraft Commander.) In addition to being responsible for coordinating the efforts of the aircrew as a whole, the Aircraft Commander (AC) was responsible for keeping himself briefed on the latest intelligence information and for maintaining an up-to-date map of hostile antiaircraft artillery (AAA) and surface-to-air missile



Pararescueman
FIGURE 17

positions. He had to be able to flight plan en route, since his objective areas were unpredictable, and he needed to be well-informed on the areas where he could land in event of emergency. Primarily, however, he had to be able to execute all the techniques of helicopter rescue.

Rescue Crew Copilot. The Rescue Crew Copilot was responsible for navigation and was required to assist the Rescue Crew Commander in accomplishing his duties. He had to be ready to assume control of the aircraft, if the pilot were incapacitated during the mission; therefore, he was briefed, by the Aircraft Commander, on best routes and other information pertinent to the mission.

Flight Engineer. The Flight Engineer preflighted the aircraft and supervised the loading and stowing of equipment. When deployed to forward operating locations, he also postflighted the aircraft and performed minor maintenance when necessary. The Flight Engineer would man the gun position on the right side of the helicopter when flying over hostile terrain; from that position, he would watch for hostile aircraft or ground activity and return enemy fire when necessary. During recovery operations, he operated the hoist and provided instructions to the pilot to place and maintain the aircraft in proper position for the pickup. He was considered a vital man in successful rescue operations. (Fig. 16.)

Two Pararescuemen. The Pararescueman was responsible for loading all special recovery equipment, first aid equipment, and survival gear aboard the helicopter. During flights over enemy terrain, he maintained a watch from the left side, or rear of the helicopter for hostile air or ground activity and returned fire when necessary. The Pararescueman had to be qualified to perform as a hoist operator in the event the flight engineer became

incapacitated, but more often the Pararescueman was lowered by hoist to assist an injured survivor (Fig. 17), and provide medical treatment when required. This vital crewmember receives 31 weeks of training in a variety of Army and Air Force schools. He is a fully qualified medical technician, an expert in survival and mountain training, is jump and scuba qualified, and is required to keep himself in excellent physical condition. After completion of all qualifying schools, he is sent to the ARRTC at Eglin AFB, Fla., to be trained as a Rescue Aircrew Team member. Some of the most stirring recoveries in the history of rescue work were accomplished by pararescuemen.

Combat Cameraman. Though not an official crewmember, the combat cameraman was carried on most orbit flights as an additional crewmember. He was considered invaluable, to document the "lessons learned".

High and Low Procedures

When a mission broke, and the helicopters were called in, the high bird would orbit over the pickup area between 5,000 - 6,000 feet. If weather or hostile activity prevented orbiting directly over the area, he would orbit at a position from which the recovery operation could be observed. He would advise the SARTF of enemy activity and could act as a forward air controller if called upon. If the low helicopter were disabled, the high helicopter would attempt the recovery, unless denied by hostile activity. The low helicopter Aircraft Commander would determine his best course of action while proceeding to the recovery site. He would compute the maximum weight at which the helicopter could hover out of ground effect, and the fuel required to complete the recovery and return to the nearest refueling point.

When the Aircraft Commander had positively determined the survivor's position and was ready to initiate the approach for the recovery, he could jettison the external fuel tanks, if he thought it necessary. Normally, the best approach was a high speed, descending pass over the survivor's position, and then a teardrop turn to arrive back over the survivor's position headed into the wind. Ideally, the survivor would then use a smoke flare, pen flare, or some other visual signal to pinpoint his position. The helicopter crew would be alert for hostile fire during the approach; and the gunners would return the fire if encountered. RESCORT or RESCAP aircraft would then take the necessary action to suppress the hostile fire, if any occurred. When the helicopter came to a hover, the flight engineer would provide directional information to the pilot to position the helicopter for the recovery. During the approach and recovery, the pararescuemen would stand at their positions prepared to return enemy fire. The flight engineer would be in position by the open cabin door with his weapon readily accessible.[12/]

Meanwhile, the high bird Aircraft Commander would determine the heading and estimated time en route (ETE) to the land or air refueling location. After the survivor had been recovered, the pararescueman would administer first aid if necessary. The flight engineer would check the helicopter for battle damage, and report to the Aircraft Commander. The copilot would report pertinent information to the AMC to include ETE to the refueling point, condition of the survivor, damage to the helicopter, and so on. Normally, the helicopter would return to its home base; however, fuel status, weather, or the medical condition of the survivor might require a deviation. If the survivor required

medical attention, the Aircraft Commander would notify the AMC to arrange to have an ambulance waiting at the recovery base.[13]

A typical Buff recovery from orbit position was flown by Maj. Gerald A. Jones, 40th ARRS, in November 1968. The mission is best described in his own words:[14]

> *"This was my first mission and it turned out to be quite eventful. We were orbiting near Lima (Site) 36 when the mission broke. The pilot /Lt. Jamie Gough/ was down in a relatively open area with much enemy gunfire from surrounding hills. The OSC mentioned that it was an extremely hot area so I was required to hold out for one and one-half hours during which time extensive sanitization was carried out by numerous fast movers. Finally I was brought in through intermittent cloud coverage. I couldn't spot the survivor at all and was taken back out as we began receiving ground fire. The survivor also came on the air and told us to leave the area. I then tried to come in from the west real low with the sun behind me. The Sandys had laid down a smoke screen for me, and flew 'daisy chains' over the area while continually firing. I still just couldn't see him, but bored on in anyway. All of my guns were firing at this time. The survivor came on the air saying, 'I can see you.' We looked everywhere but couldn't see him. We were taking fire and I told the Sandys, but failed to give them the exact positions. As I was casting about, the survivor came on again, 'You're right over me.' I did a quick 180° and there he was! The hoist operator sent down the penetrator while the rest of crew fired from the other guns. In about 30 seconds we had him aboard and we egressed climbing and turning all the way. In retrospect I could have done much better--I think I depended too much on spotting the survivor rather than depending on the OSC, plus I should have gone in a little lower. The survivor had sustained some injuries during ejection so we made him as comfortable as possible. We rushed back to Udorn and the ambulance was waiting. One of the problems in a high threat area such as this was that when the hoist was in operation, we lost the service of the #2 mini-gun."*

The description of the rescue by Major Jones, while being interviewed, did not detail the intense hostile fire during ingress, egress, and throughout the area. Six flights of fast movers were put on the numerous hostile gun positions in the area for suppression. Additionally, there were many enemy troops within 200 yards of the survivor. As a matter of fact, the pickup was made on the last possible attempt. The survivor was in the open, being fired on from surrounding gun positions, and being approached quickly by enemy troops. A heavy smoke screen was used for ingress and egress. It was a brilliant recovery, daringly conceived to bring out a fellow flyer under extremely dangerous conditions.[15/]

The save of Lieutenant Gough brings to mind the words of the Commander of the 3d ARRG in 1968. "When a man is down, he is far more than a statistic. He is a fellow American, with a family at home, with hopes and dreams and a potential that cannot be measured. He is a man in trouble, and he needs help fast."[16/]

Other SAR Aircraft

The Navy primary rescue aircraft was the SH-3 (same as HH-3) with the Call Sign Big Mother. The smaller UH-2, with Call Sign Clementine, was also frequently used as a SAR aircraft. The Army UH-1, with Call Sign Dust-off, often was the first aircraft to arrive in an in-country SAR area.[17/]

The performance figures of the other SAR aircraft were as follows:

SH-3 BIG MOTHER/UH-2 CLEMENTINE (NAVY)

4	Crew	4
100	Speed	110-120
250	Radius	85
3+30	Endurance	2+00
2 M-60 Guns	Armament	2 M-60 Guns
Yes	Armor Plate	Yes
150	Hoist Capability (ft.)	100
UHF, HF	Communications	UHF, HF
ADF, UHF	Homer	ADF, UHF

UH-1 DUST-OFF (ARMY)

Crew	4
Speed	100
Range	190
Endurance	2+00
Armament	M-16
Armor Plate	Yes
Hoist Capability (ft.)	125 & 240
Communications	UHF-FM
Homer	FM

CHAPTER V

RESCORT

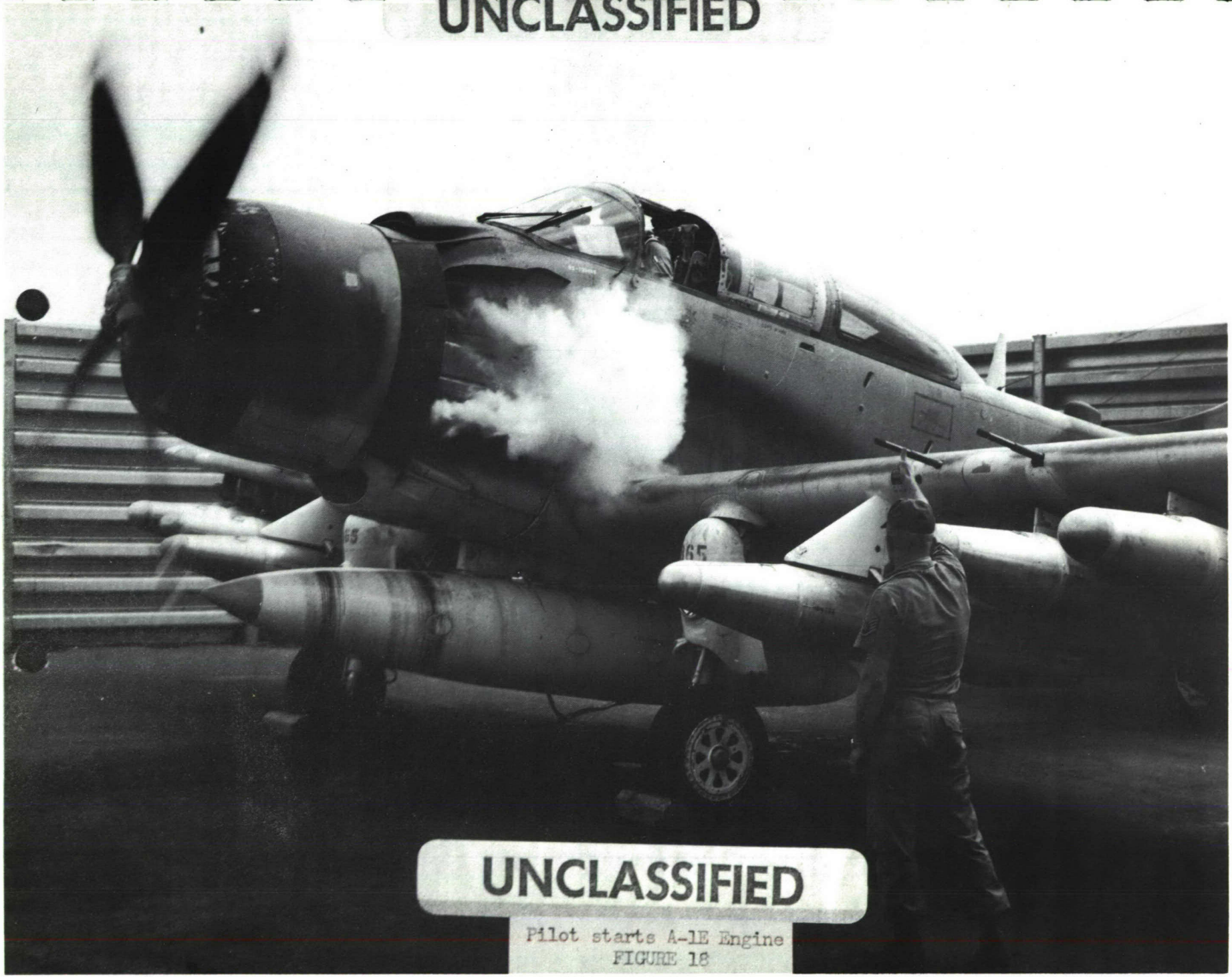
An integral and important part of SAR was the A-1E/H Rescue Escort (RESCORT) aircraft with the Call Signs Sandy and Spad. The Sandys were part of the 602d Special Operations Squadron (SOS), 56th Special Operations Wing (SOW) at Nakhon Phanom (NKP) in Thailand; the Spads were assigned to the 6th SOS, 633d SOW at Pleiku in SVN. The A-1s had the dual responsibility of protecting the Jolly Green and Buffs, as well as locating and protecting the downed aircrewmen. They operated on the principle of airborne orbit alert (Fig. 3), and ground alert to achieve the quickest reaction time (Figs. 18, 19). On a daily basis, four Sandys would stand ground alert at NKP from daylight until 1535L, at which time two of the four would take off to fly the airborne orbit in Central Laos until sundown. While two of the original four remained on ground alert, two additional aircraft would take off to fly the Northern Laos orbit with the Buffs. The Spads in-country, would stand alert at Pleiku as fragged, while two would stage at Da Nang AB, SVN, standing alert to support rescue missions as they occurred.[1/]

RESCORT Procedures

The airborne element of RESCORT aircraft would provide escort for the recovery helicopters to and from the recovery site. When the helicopters reached the rescue scene, they would establish an orbit over the least hostile point in the immediate area, while the RESCORT aircraft began the search for the survivor. Although no two SAR efforts were ever completely alike, the following two search patterns were generally used:[2/]

High Search. This search was performed by two A-1s flying a forward-moving "S" pattern at about 4,000 feet over the general area of the downed crewmember. The pattern was approximately three miles wide. The purposes of this search were to get good radio coverage to contact the survivor; to get a comprehensive mental picture of the terrain; and to "troll" in an attempt to pinpoint active AAA positions by drawing their fire. During this search, the wingman flew approximately 500 feet higher than the lead aircraft and watched for ground reactions. If necessary, he called certain evasive actions to the leader and would often fire his 20-mm gun and WP rockets to degrade the accuracy of the gunners (Fig. 20). However, he would not necessarily go after the guns at that time, since the primary objective was still the search. This phase terminated when contact was made with the downed crewmember and the general threat area had been thoroughly "trolled" (drawing fire in order to spot gun positions).[3/]

Low Search. This was also a forward-moving "S" pattern, about half a mile wide and flown at altitudes ranging from 100 to 500 feet. It was used to spot the survivor and get his evaluation of the ground fire threat. During this low altitude troll, small arms and automatic weapons positions in the immediate area of the survivor could be identified. Terrain reference points near the survivor were noted, and this information, together with wind direction, temperature, and terrain elevation would be used by the rescue helicopters during the pickup. Finally, an M-47 white phosphorous (WP) bomb would be dropped about a mile away and in a specific direction from the survivor to mark his approximate position and yet not give it away to the enemy.[4/]



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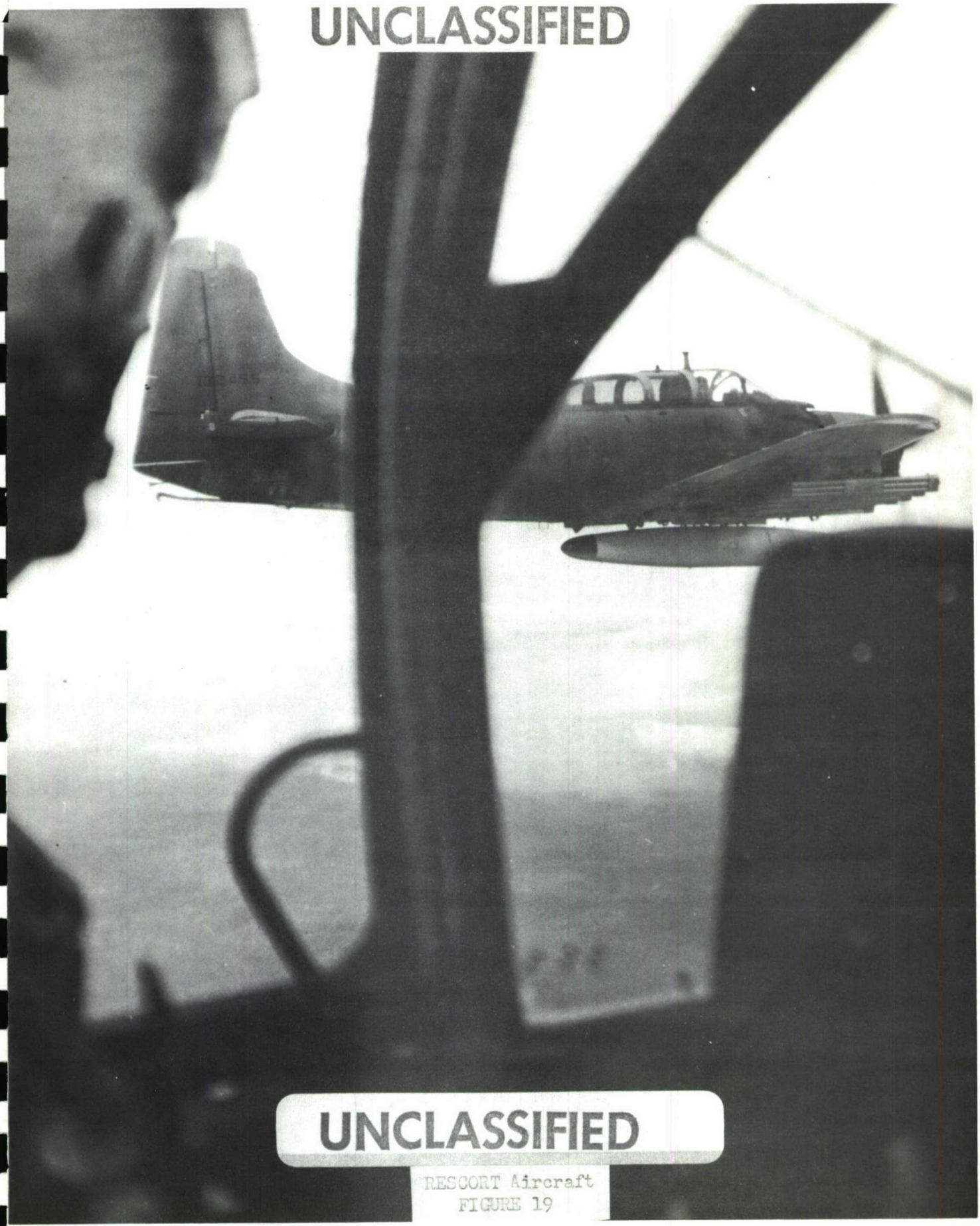
Pilot starts A-1E Engine
FIGURE 18



RESCORT Aircraft
FIGURE 19

SANDY expending Ordnance
FIGURE 20

Suppressing Hostile Fire. Based on the terrain features, the weather, and the distribution of AAA positions in the objective area, the OSC would select the most desirable ingress/egress route for the helicopters and decide which guns were to be silenced. At this point, the effort would often take the form of a normal, FAC controlled, strike operation. Fast movers arrived on the scene, the FAC marked the target, and briefed the crews, and the attack would begin. The strike would continue until all threatening guns had stopped firing. The OSC would then assess the situation and decide if the area had been sufficiently sanitized to pick up the survivor.[5/]

The Recovery. The rescue helicopters would depart their orbit position and head toward the survivor, flanked by A-1s firing their 20-mm guns directly ahead to suppress potential small arms/automatic weapons fire along the ingress route. The four A-1s would then form a "daisy chain" over the survivor. This was a square pattern, with equal spacing between each aircraft, at an altitude higher than that of the helicopters. The survivor would be asked to "pop his smoke" to clearly mark his position. As the helicopters came in for the pick-up, the A-1s in the daisy chain would suppress any ground fire. If things got too hot, the pickup would be aborted and the ground fire would be further suppressed by fast movers before another pickup attempt was made. The aircraft commander of the pickup helicopter would sometimes ask that white phosphorous (WP) smoke be dropped between gun positions and the survivor to shield the rescue activity. This was a risky decision, however, since there was always the possibility that the smoke would drift over the recovery area.[6/]

As of November 1968, 7AF considered that the RESORT force had been barely sufficient to meet the SAR sortie rate for support of tactical operations over Laos and North Vietnam. After the bombing halt of 1 November, the situation eased somewhat, but there was still concern over the possibility of expanded Laotian operations and the requirement for a commensurate number of RESCORT aircraft. It appeared that RESCORT forces would be required in SEA, until such time as a primary rescue aircraft could be developed that could survive in a high threat area, with performance characteristics similar to the A-1, speed in the 200-to-500-knot range and a long loiter time. Serious consideration was even given to modifying the A-37 aircraft for aerial refueling to permit long-range escort duty.[7/]

In the opinion of Col. Hollon H. Bridges, Commander, 3d ARRG, the RESCORT A-1s of the Special Operations Forces should be a permanent and integral part of the SAR forces. The requirement to draw on outside support for so vital a portion of the SAR effort could in time create problems as the SAR responsibility evolved. Therefore, it seemed essential that the ARRS develop RESCORT capability as a part of its overall force. He further stated that the aircrewmen involved in RESCORT operations should be as thoroughly trained and schooled in the concepts and tactics of SAR operations as any element of the dedicated SAR force.[8/]

A 6th SOS unit history noted that during the period of 1 January through 31 March 1969, 30 major SAR efforts were made by the RESCORT squadron and that aircrew members had been rotated on a weekly basis to insure that all Spad pilots become SAR qualified.[9/] The Chief of JSARC voiced some concern

about making all A-1 pilots qualified for SAR operations, when he said: 10/

> *"The 602d Squadron, as part of the 56th Sp. Ops. Wing, was, up until six weeks ago, the only RESCORT squadron (out-country), but it was discovered that the loss rate on Sandy/Spad pilots was running about 20% over a year's tour. So now we have been asked to frag the Sandy/Spad mission against the wings rather than just against the squadrons. The only problem with spreading the risk this way is that it could spread the experience as well and might degrade the effects of the mission. Actually an A-1 man, in the past has acquired six months experience on "Firefly" and other missions as wingmen and lead before becoming a Sandy or Spad pilot."*

There was no indication, however, that the RESCORT mission had been degraded in any way as of June 1969.

A review of 30 RESCORT SAR efforts in early 1969 demonstrated the continued dedication, determination, and spirit of the RESCORT pilots. On 17 January, Maj. William Farnham and Capt. William Thompson were scrambled from Da Nang to fly as RESCORT on a SAR effort for Stormy 2B (front seat pilot identified as "A", rear seat pilot as "B") in an area of heavily concentrated enemy forces. Shortly after their arrival at the scene, a SAR aircraft, Sandy 2, was shot down. Major Farnham quickly located the downed pilot, established communications with him and started to orbit the area to provide cover. He became the On-Scene-Commander for recovery of this pilot. He soon became the target of intense and accurate antiaircraft fire from several enemy positions. After a flight of F-105s had expended their ordnance, Major Farnham and Captain Thompson continued to suppress the ground fire with repeated low-level attacks.

After about three hours, ordnance exhausted, and low on fuel, they were forced to abandon the SAR effort due to darkness, with the survivors still on the ground. At first light the next day, the rescue effort was resumed and a second rescue aircraft was promptly shot down, Sandy 10. Major Farnham and Captain Thompson reentered the battle and repeatedly attacked the opposition, until their ordnance was expended, and low fuel again forced their return to base. Many other Spad and Sandy pilots participated in this SAR effort. The details of this effort are covered in Chapter VII, but the final talley for this effort was five aircraft lost: two A-1s, one HH-53B, one O-2, and one F-4, but ten people were saved! A notable achievement.[11/]

The use of CBU-19 (CS) was demonstrated on 15 February in the rescue of an F-4 pilot, Pintail, near the A Shau Valley. This rescue effort was in its second day and not progressing satisfactorily. The area was saturated with 57mm, 37mm, and other antiaircraft weapons. Numerous flights of fast movers had been sent to the scene in an effort to reduce the volume of fire, but the concentrated fire continued to take its toll. The On-Scene-Commander, Sandy 1, in a Skyraider, was shot down and killed. At this point, the whole rescue effort appeared to be degrading. Bringing in the Jolly Greens would have been suicidal. The only hope rested on employing the special munitions, CBU-19, used only once or twice before on a SAR, and carried on this mission by the Spads from Pleiku. Delivery of this ordnance required a long, straight, attack at low altitude and slow speed. Under the most permissive of environments, a mile-long run at 300 feet above the terrain and at 220 knots was hazardous. In this environment, under heavy attack, the risks were beyond measure. The

RESCORT pilots, now dangerously low on fuel, positioned themselves for the attack. The mountainous terrain, slow speed, and low altitude required a near suicidal course over known 37-mm gun positions. Leveling off at low altitude and pressing through a hail of antiaircraft fire, the Spads expended their CBU-19 right on target. The gun positions were effectively silenced and the Jolly Green was able to rescue the downed pilot a few minutes later without receiving any ground fire. Another pilot had been recovered at the last possible moment from probable captivity and possible death. RESCORT was, and would continue to be, a vital part of SAR efforts.[12/]

CHAPTER VI

RESCAP/SUPPORT FORCES

The support forces for a SAR effort were those high performance aircraft deployed for protection of the primary forces, and for the downed crewmember; the role was called Rescue Combat Air Patrol (RESCAP). Before the bombing halt, a SARTF, composed of an HC-130 for command and control, two Jolly Greens or Buffs, and four RESCORT A-1s, would be deployed to recover a survivor in North Vietnam. North Vietnam offered vast uninhabited areas that were mostly inaccessible on the ground; thus, the SARTF usually needed only fighter protection from enemy aircraft to successfully effect the rescue. After the bombing halt, however, the out-country air was confined to Laos, which provided fewer and smaller sanctuaries for rescue. Recovery in this area required a planned coordinated attack of strike forces before a rescue attempt could be considered. In most areas of operation, the defenses were so heavy that several hours were often required for strike forces to sanitize an area sufficiently to attempt a rescue.[1/]

Resources

The overall responsibility for providing and controlling the RESCAP/Support Forces to aid in a SAR effort rested with the Seventh Air Force out-country Command Center, "Blue Chip". The control process was straightforward and simple when the rescue was to take place out-country, because the JSARC was collocated with Blue Chip. For rescues within South Vietnam, however, the support forces were provided by the in-country command center, TACC, and Blue Chip would delegate control authority to the Senior Duty Officer of TACC.[2/]

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EB-66
FIGURE 21

Procedures

When a mission broke in the upper Route Packages and the requirement for the support forces was identified, Blue Chip would notify JSARC that aircraft were being deployed with the necessary border clearances. These forces could include: two or four F-4s; four F-105s, holding on tankers for possible suppression or escort duty; IRON HAND (F-105) flights, alerted if SAM threats were involved; and an EB-66 aircraft (Fig. 21) alerted to provide electronic countermeasure (ECM) support, if required.[3/]

"Panama" and "Hemlock" radar sites were the control extensions of Blue Chip to the RESCAP/Support Forces. They were required to pass definitive instructions to the rescue support forces and to monitor and record their status. The data passed to Blue Chip included fuel state, ordnance remaining, battle damage, and any pertinent information about ingress and egress routes. During the entire mission, Blue Chip would work closely with JSARC, which was controlling the primary rescue forces, each keeping the other informed as the mission progressed.[4/]

RESCAP Forces

RESCAP aircraft would engage hostile aircraft if they attempted an attack. As a secondary role, RESCAP would participate in the search phase of the mission at a medium altitude and conduct both electronic and visual search. If other support aircraft (fast movers) were brought into the area, the RESCAP aircraft would climb to a higher altitude over the scene and establish high CAP. The additional support aircraft would perform search, establish a low CAP, and provide suppressive fire, if required. If the area were heavily defended, the

high RESCAP aircraft could be brought down to suppress ground fire. Finally, they provided a high CAP during the egress of the SARTF.[5/]

Hostile Fire Suppression

The suppression of revetted and camouflaged gun positions was an exacting and time-consuming operation. FACs were often used, particularly if one familiar with the specific area were available. Although no unique strike procedures were used during the suppression, variations were almost always required, because of the widely differing situations surrounding each rescue attempt. While one flight of fast movers (usually four) were attacking, the succeeding flight would be held in orbit safely above the attack pattern, but at an altitude to permit the observation of the enemy AAA gun flashes. The RESCORT A-1s would perform visual search, establish the low CAP over the helicopters, and provide the suppressive fire that was required near the survivor. Their slow airspeed was more compatible with the smaller area in the immediate vicinity of the survivor.[6/]

Crown AMC

The Crown HC-130 AMC tried to anticipate the requirements for any specific ordnance, a change in tactics, or the need to use chemical agents. He would, of course, be in constant touch with the JSARC and Blue Chip either directly or through the control agencies discussed earlier.[7/]

Sanitization of AAA Threat Areas

The 7AF Directorate of Tactical Analysis prepared a report "Sanitization of AAA Threat Areas" in June 1969, which included portions of three SAR efforts

NUMBER OF AAA UNITS ATTACKED BY FAST MOVERS

	SCOTCH 3	STREETCAR 304	HELLBORNE 20	OVERALL
I Complex	3	1	3	7
II 37-mm Site	0	5	6	11
III 1 x 37-mm gun	1	5	3	9
IV SA/AW	5	2	5	12
Total AAA Units	9	13	17	39

APPROXIMATE DISTANCE OF AAA UNITS FROM SURVIVOR (MILES)

	SCOTCH 3	STREETCAR 304	HELLBORNE 20
Minimum Distance	.2	.3	.1
Maximum Distance	5.5	3.6	4.3
Average Distance	2.3	1.5	1.3
Approximate 80th Percentile	3.1	2.2	2.4

FIGURE 22

that took place during the summer of 1968. The basic purpose of this report was to measure the level of suppression effort to determine the possible relationship between the effort expended and the AAA threat. It described other characteristics of the SAR process as well. Pertinent excerpts are included here to demonstrate the large number of aircraft and amount of ordnance delivered on SAR missions.[8/]

The three SAR efforts studied were SCOTCH 3 (2 July 68), STREETCAR 304 (1 and 2 June 68) and HELLBORNE 20 (26 July 68). In each case, efforts to rescue the pilot before nightfall had failed. SCOTCH 3 and HELLBORNE 20 were recovered on the second day, while STREETCAR 304 was rescued on the third day. Of course, both the hostile and friendly forces were thoroughly prepared for battle by the second day. The SCOTCH 3 and HELLBORNE 20 missions took place in Route Package I, while the STREETCAR 304 effort took place in the STEEL TIGER area of Laos. The AAA units struck by A-1s or rescue helicopters were not included in the analysis, since most of the sanitization was done by fast movers. Figure 22 depicts AAA units attacked and the approximate distances between the survivor and the AAA units. These statistics are presented to provide a general picture of the number of units attacked, in relation to the size of the areas worked.

Terrain features, the weather, and distribution of AAA units in the vicinity of the survivor all influence the selection of ingress and egress routes for the pickup. Once the routes are determined, the AAA weapons are attacked in the immediate vicinity of the survivor and along the ingress and egress routes out to a distance of about two and one-half to three miles.[9/]

During the SCOTCH 3 SAR effort, 42 F-4s were allocated to the mission, and 32 were used. Twelve F-105s were also used. Additionally, there were five Misty (F-100) FACs and one Covey (O-2) FAC used; two FACs were on-scene almost continuously. When the primary SAR aircraft, consisting of eight A-1s, four helicopters and two Crown aircraft are added, the total number of aircraft involved totals 74. During the nine-hour mission, 121 tons of ordnance were expended.[10/]

An examination of the STREETCAR 304 mission revealed that 44 F-4s and 42 F-105s were involved for a total of 86 support aircraft. Additionally, six Nail (O-2) FACs were used, and approximately eight A-1s, six helicopters, and three Crown primary SAR aircraft were used during the 28-hour mission. The total number of aircraft involved was approximately 109. The figure becomes "approximate" because the total number of primary aircraft was estimated from incomplete records. Eighty-six tons of ordnance were expended.[11/]

During the HELLBORNE 20 mission, 38 F-4s, 11 F-105s, five A-6s, two A-4s, and seven A-7s were involved, for a total 63 support aircraft. Additionally, four Misty FACs were used with an estimated 14 primary SAR aircraft to make a grand total of approximately 81. The mission lasted 10 hours and a total of 118 tons of ordnance were expended.[12/]

The totals of all aircraft and tons of ordnance used in just three missions are depicted here:

AIRCRAFT AND ORDNANCE USED

	Support Aircraft	Primary Aircraft	Ordnance (tons)
SCOTCH 3	54	20	121
STREETCAR 304	86	23	86
HELLBORNE 20	63	18	118
TOTAL	203	61	325

The vastness of these three rescue missions is apparent in the total number of aircraft used (264); total tons of ordnance expended (325); plus the untold number of personnel (and equipment) utilized, include aircrewmen, maintenance men, operations personnel, and all the people required to operate the Command Centers, RCCs, CRCs and the JSARC.[13/]

Pilot interviews indicated that interruptions (night, weather, hostile action) during a SAR effort quickly negated the beneficial effects of sanitization. Accordingly, there appears to have been a direct relationship between the number of interruptions and the total number of aircraft and ordnance required for successful completion of the mission. When strike aircraft could be brought in as rapidly as possible and without interruption, the task of sanitization could be accomplished with the least expenditure of resources.[14/]

It was an unassailable fact that the RESCAP/Support portion of the SAR efforts was just as important to ultimate success as was any other. The "interruption" aspect (night, weather) of SAR operations was under continual study in SEA. There was no way to estimate the number of lost aircrew members that might have been saved had there been an operational Night Recovery System, but had there been only a few, the cost of such a system would have been fully justified.[15/]

CHAPTER VII

GREATEST EFFORTS

Of the hundreds of dramatic Search and Rescue efforts made in SEA from November 1967 to June 1969, a few emerged as outstanding in demonstrating the dedication and spirit of SAR personnel. Others proved the value of prepositioning SAR forces, and the orbit concept.

Three Busy Days

The busiest three days in the history of SAR took place in January 1969. Action began at 1418 hours local time on 17 January, with Stormy 2, an F-4 aircraft, being shot down in the Tchepone area in South-Central Laos. Crown 6, on standard orbit, received the distress call and diverted to the scene. Nail 25, an O-2 FAC in the area, established beeper and voice contact with Stormy 2B. The survivor reported that he had a broken arm and leg, was lying on his back in tall grass, and could not move. No contact was made with Stormy 2A, and no parachute was seen. Crown 6 launched Jolly Greens from Quang Tri and requested Spads and Sandys. Two F-4 flights in the area were brought in. Additional flights were requested. Hostile ground forces had moved into the area, so Nail 25 cleared the F-4s to strike. Sandy 1 and 2 arrived on scene at 1522 hours. While evaluating the area, Sandy 2 was hit by ground fire and bailed out. Voice contact was quickly established and he advised that he was uninjured. About this time, Spads 11 and 12 arrived on the scene and provided a CAP for Sandy 2, while Sandy 1 proceeded back to Stormy 2B. At 1555 hours, Jolly Greens 31, 32, 34 and 3 arrived and were held a safe distance from the pickup area, due to heavy ground fire from 37-mm,

57-mm, and automatic weapons. Fourteen flights of fast movers, six Sandys, and six Spads sanitized the area constantly until darkness, but could not sufficiently clear it for a pickup. Six Jolly Green refuelings were made by Crown 4, which had been launched to provide tanker service, since Crown 6 was totally involved in controlling the mission.

As darkness fell, the forces were all returned to base and a first-light effort was planned. Super Jolly Greens (Buffs) 67, 68, and 70 were prepositioned from Udorn and NKP to participate in the first-light effort. It had been decided to pick up both men simultaneously. The first-light effort got underway with Buffs 68 and 67 going after Stormy 2B and Jolly Greens 37 and 17 going after Sandy 2. Nine Sandys and eight Spads were escorting the helicopters and providing cover, while 17 fighter flights, 2 Misty FACs (F-100s), and 3 Hobos (A-1s) ingressed to strike the target area. Weather prevented the simultaneous effort as Sandy 2 could not be worked, due to low clouds and ground fog. The entire effort then concentrated on Stormy 2B. During this effort, Sandy 10 was shot down with no chute seen and no radio contact. Crown 4 was controlling, while Crown 2 backed up as tanker. At 0945 hours, Buff 68 was directed in to pick up Stormy 2B. The survivor was in tall grass and immobile. As the rotor wash of Buff 68 blew the grass down, Stormy 2B was observed raising his right leg. The Buff pilot then lowered the aircraft below the tall trees to shield the pickup attempt from a 37-mm site located on a hill 1,000 yards south. The pararescueman was lowered to cut away the chute of Stormy 2B and to splint his left arm, while the Buff hovered for 22 minutes. The survivor was then brought up on the hoist by the pararescueman. Buff 68

egressed quickly, with the Sandys strafing all the way.[1/]

Meanwhile, the Sandy 2 area cleared and Crown 1 began to control operations. Jolly Greens 17 and 37 were held five miles from the scene, while Crown 1 fed the fast movers to Sandy 9, the OSC. Upon completion of the Stormy 2B mission, Jolly Greens 17 and 37 were orbiting, awaiting a pickup call, but had to return to NKP due to low fuel. Buff 67 was joined by Buff 70 for the pickup. At 1335 hours, Buff 67 was called in for the recovery and made the pickup within five minutes despite heavy ground fire. While egressing, about one mile south of the pickup point, Buff 67 was hit by a 37-mm burst in the aft pylon area and immediately lost pressure in two hydraulic systems. The flight engineer saw the 37-mm gun that had hit them, and silenced it with his mini-gun. Sandy 7, which was escorting, located a suitable area and directed the damaged Buff into it for a crash landing. At 1345 hours, Buff 70 landed within 200 yards of Buff 67 and picked up all the downed personnel within 10 minutes. Buff 70 returned all survivors to NKP, but the pararescueman on Buff 67 lost his leg as a result of the 37-mm hit. Since Buff 67 was basically intact, and in a hostile area, the 3d ARRG Commander, reluctantly approved the destruction of the helicopter. Rustic, a flight of F-4s, did the job.[2/]

About this time, to further complicate matters, a Covey FAC aircraft (O-2, Fig. 23), with Coveys 285 and 264 aboard, was shot down. Two good chutes were seen and Crown 2 contacted the FACs. Jolly Greens 16 and 20, and Sandys 15 and 16, which were just then departing the Buff 67 scene, were contacted and advised to proceed to the new area. The Jolly Greens refueled en route by Crown 2, which then assumed control of the new mission. Sandys 19 and 20

O-2
FIGURE 23

were scrambled out of NKP, and these FACs located both survivors between 1616 hours and 1619 hours. Jolly Greens 16 and 20 remained on scene, but held short to await a pickup call. At 1622 hours, Sandy 19 replaced Sandy 15 as OSC and brought in several flights of fast movers to clear the area around Coveys 285 and 264. Although the two men were located within 30 meters of each other, they were not able to get together because of the rugged terrain. Sandy 19 made his analysis of the area and decided to bring in Jolly Green 16 for a pickup attempt. Jolly Green 16 was escorted in to Covey 285 by four Sandys, but began taking ground fire and was forced to withdraw with battle damage. Jolly Green 20 escorted Jolly Green 16 back to base as additional fast movers were brought in around Covey 285. Jolly Greens 4 and 32 arrived at 1825 hours and Sandy 19 quickly led Jolly Green 32 in for a successful pickup of Covey 285. As Jolly Green 32 was about halfway to Covey 264, the helicopter received ground fire and was forced to return to base with numerous holes in its aft fuel tank, which was losing fuel rapidly. The area obviously could not be cleared enough to make another attempt before dark, so a first-light effort was agreed upon. Covey 264 was advised to stay off the radio and dig in.[3/]

The effort for Covey 264 began the next morning at 0645 hours when Crown 1 arrived on scene. Covey 264 advised that he was in good shape and that hostile forces were in the area southeast of him. Misty 11 (F-100) also arrived on scene at 0645 hours, but no sanitization was attempted until Sandys 1 and 2 arrived shortly thereafter. Buffs 69 and 71 arrived at 0715 hours, escorted by Sandys 3 and 4. Sandy 1, as OSC, located Covey 264 and brought

in five flights of fast movers (F-4s and F-105s) that were waiting. After the fast movers finished their strikes, four flights of A-1Hs were used to secure the immediate area around the survivor. Covey 264 was asked if there were any movement around him. He reported activity about 1,000 yards to the south. Sandy 1 then directed Spads 7 and 8,which were carrying CBU-19 (CS) to blanket the total area, to the south of the survivor. The Buffs were advised to use their masks. Buff 69 was then brought in for a pickup attempt. The survivor advised that he was getting sick. He was apprehensive and had some difficulty in directing the Buff in. The survivor was recovered at 0920 hours, with no hostile fire being received. The Sandys and Spads escorted the Buffs back to NKP. Although Crown 3 was airborne and available, no refuelings were necessary. During this hectic three-day period, 40,200 pounds of fuel were transferred in 14 refuelings. This capability undoubtedly contributed heavily to the success of the efforts.[4/]

The scope of the Tchepone effort was most impressive. Seventy A-1s (Sandys, Spads, Hobos) were involved in the effort. Sixteen helicopters (Buffs, JGs) were utilized as primary rescue vehicles. Sixteen FAC aircraft (O-2s, F-100s) participated in direct strikes. Five HC-130 Crown aircraft were on hand to control operations and refuel the helicopters. Fifty-nine flights of fast movers (F-104s, F-105s), two- and four-ship elements, were used to suppress flak and enemy ground activity. A total of 284 aircraft were involved. The three-day period became even more impressive when the overall 3d ARRG activity for the period was considered. The Group was concurrently involved in 21 separate incidents from IV Corps to Northern Laos and Thailand. Thirty-seven saves were made during the 72 hours--19 combat and 18 non-combat.[5/]

In contrast to the three-day mission, on 28 January 1969, the orbit concept was proven without question when Wolf 2, an F-4, was shot down at 1745 hours in the same general area and environment. Wolf 3, his wingman, had radio contact with 2A, while he was still descending in his chute. He drifted over a small karst into some trees. Nail 54 (O-2 FAC) was in the area and saw both chutes descend. Sandys 1 and 2, on orbit with Jolly Greens 36 and 20, diverted to the scene and arrived at 1802 hours. Voice contact had been established with both survivors. Crown 2 advised of heavy gun positions flanking the area just beyond the karst from the survivors. Sandys 3 and 4 were scrambled from NKP, while Jolly Greens 09 and 19 were deployed from orbit. Several fast movers arrived at 1815 hours. The Sandys checked the area and noted no hostile activity on the survivor's side of the karst; however, hostile forces were observed en route from the road. Jolly Green 36 was brought in by Sandys 1 and 2 and picked up Wolf 2B at 1836 hours and 2A at 1841 hours. A total of 56 minutes had elapsed. The mission was brilliantly executed from orbit positions. With hostile forces so close to the survivors, a longer reaction time could easily have resulted in failure.[6/]

All rescue efforts, however, were not successful. Many aircrewmen were captured before SAR forces could arrive; others died while awaiting rescue; some died after being rescued. Probably the most poignant effort of the war was made on 14 June 1969. Wolf 5, an F-4, was working in Central Laos when Nail 19, an O-2 FAC, heard a call that Wolf was experiencing hydraulic difficulty. Shortly thereafter, Wolfs 5A and B ejected. Warpaint, a Navy A-4, was the first to arrive on scene. Nail 19 arrived shortly thereafter and

assumed On Scene Command after being briefed by Warpaint. Pony Expresses 10 and 12 of the 20th SOS, Udorn (CH-3E helicopters), heard the Mayday call on guard channel and volunteered assistance through Invert (a radar unit) and Cricket (the ABCCC aircraft). A check was made by these command and control agencies as to the availability of Jolly Green aircraft, but none was in the area at the time. Hearing this, Pony Expresses 10 and 12 advised their Hobo escort (A-1) that they were proceeding to the scene. They checked in first with Nail 19 and then with Sandy 1 when this aircraft arrived and assumed On Scene Command. The position of Wolf 5B was quickly pinpointed and Pony Express (PE) 12 picked him up. The penetrator hoist malfunctioned, whereupon PE 12 airlifted the survivor on the hoist to a flat knoll four km west, where a landing was made and the survivor was brought aboard. He had minor cuts and bruises and a possible back injury.[7/]

Meanwhile Wolf 5A was pinpointed and contacted by PE 10. Wolf 5A vectored PE 10 to his position by voice and smoke. The survivor appeared to be in good condition and his transmissions were coherent. His position was at the edge of a jungle canopy, which rose steeply into a karst nearby. The pilot of PE 10 noted that the beginning of the vertical karst was so close to the survivor that his only approach was a backward movement of the helicopter into a position directly overhead. PE 10 (with standard three-leaf-seat-jungle penetrator) hovered over Wolf 5A, lowered the penetrator to its full extension, but had to descend farther to get it on the ground. The hoist operator noted that all three seat positions were lowered by the survivor, but the chest restraining strap was not used. During the descent, the

helicopter rotor blade contacted some jungle vines and received severe blade damage. There was also a smell of smoke as the survivor was being hoisted. The helicopter pilot, concerned for the safety of his aircraft and crew, initiated a 10-kt forward speed course to the next ridgeline, where he planned to land and bring the survivor on board. The survivor was clear of the trees when the forward speed was started. The hoist operator saw Wolf 5A grab the top of the penetrator and wave, whereupon the hoist was raised. The hoist operator was of the opinion the the pilot came through the top of the forest canopy with a branch across his legs. Shortly thereafter, the hoist operator observed the pilot had slipped from the seat and was holding on to the penetrator seat by his hands with arms extended over his head. The survivor was unable to retain his grip and tumbled to the ground from a height of about 500 feet. Subsequent transmissions from Sandy 1 to Wolf 5A were unsuccessful. The SAR effort was terminated approximately 45 minutes after the pilot fell from the penetrator. A visual and electronic search was continued until dark on 14 June, and by O-2 aircraft the following morning, without results. Heavy foliage in the area precluded any chance of making a successful visual search. Friendly ground forces were alerted to search for the body. The accident, and it was that, could be attributed only to the unfortunate position of the survivor, and because he probably forgot to lock the chest restraining strap.[8/]

All important missions were not necessarily of a combat nature. Many humanitarian efforts were made. On 3 December 1968, Crown 7 joined with two Jolly Greens to fly 100 miles out to sea, off the coast of Vietnam, to a German tanker where two crewmen were suffering from food poisoning. The dramatic

recovery took place at night with Crown 7 providing flares for illumination. One of the JGs hovered over the tanker and a pararescueman went down and brought up the sick men. A doctor was aboard and treated the men while en route to a hospital in Vietnam.[9/]

On another occasion, in the spring of 1968, a Buff recovered a Thai woman who was in the process of having triplets, and in severe pain. The woman was taken from a small isolated village and delivered to a hospital.[10/] There were numerous episodes that included dedicated effort by all concerned, and particularly by the pararescuemen. (PJ). On 29 March 1969, after a long approach through intense hostile fire, a pararescueman went down on the penetrator to a survivor who was located on top of a karst that was quite inaccessible from the ground. The survivor was in severe shock and suffering from a broken leg and a broken arm. The PJ assisted the man for a number of minutes, while four Sandys worked the surrounding area over continuously. He was finally able to get the survivor on the hoist and carried him up into the JG. Still under intense fire, the JG egressed safely and took the badly injured man to the hospital ship Repose.[11/] On another occasion in April 1969, a PJ was on the ground for more than 30 minutes in the midst of an extremely hot area to recover the body of a pilot who had received fatal brain damage during ejection. A complete report could be written about these pararescuemen in SEA.[12/]

A different kind of rescue took place on 5 October 1968, when Crown 6, on orbit over the Tonkin Gulf, received a call from a Forward Air Controller that an Army Ground Recon Team was under intense enemy fire and desperately

needed assistance. A classic SAR effort developed with 14 A-1E Sandys and Spads and numerous Army helicopter gunships being used to suppress the ground fire of the hostile forces. JG 28 was cleared in to attempt a landing to pick up the survivors, but in the process it received numerous hits from enemy ground fire and was forced to leave the scene. Shortly thereafter, JG 10 started in for the pickup and received intense ground fire from the enemy below and eventually crashed and burned. The crew of JG 10 were feared lost, until contact was later made with the PJ and the aircraft commander who was injured. After sortie upon sortie was employed to silence the ground fire, JG 32 moved in for a hovering pickup, while JGs 25 and 21 stood by as backup. JG 32 managed to successfully recover the four survivors of the ground team plus two crewmembers of JG 10.[13/]

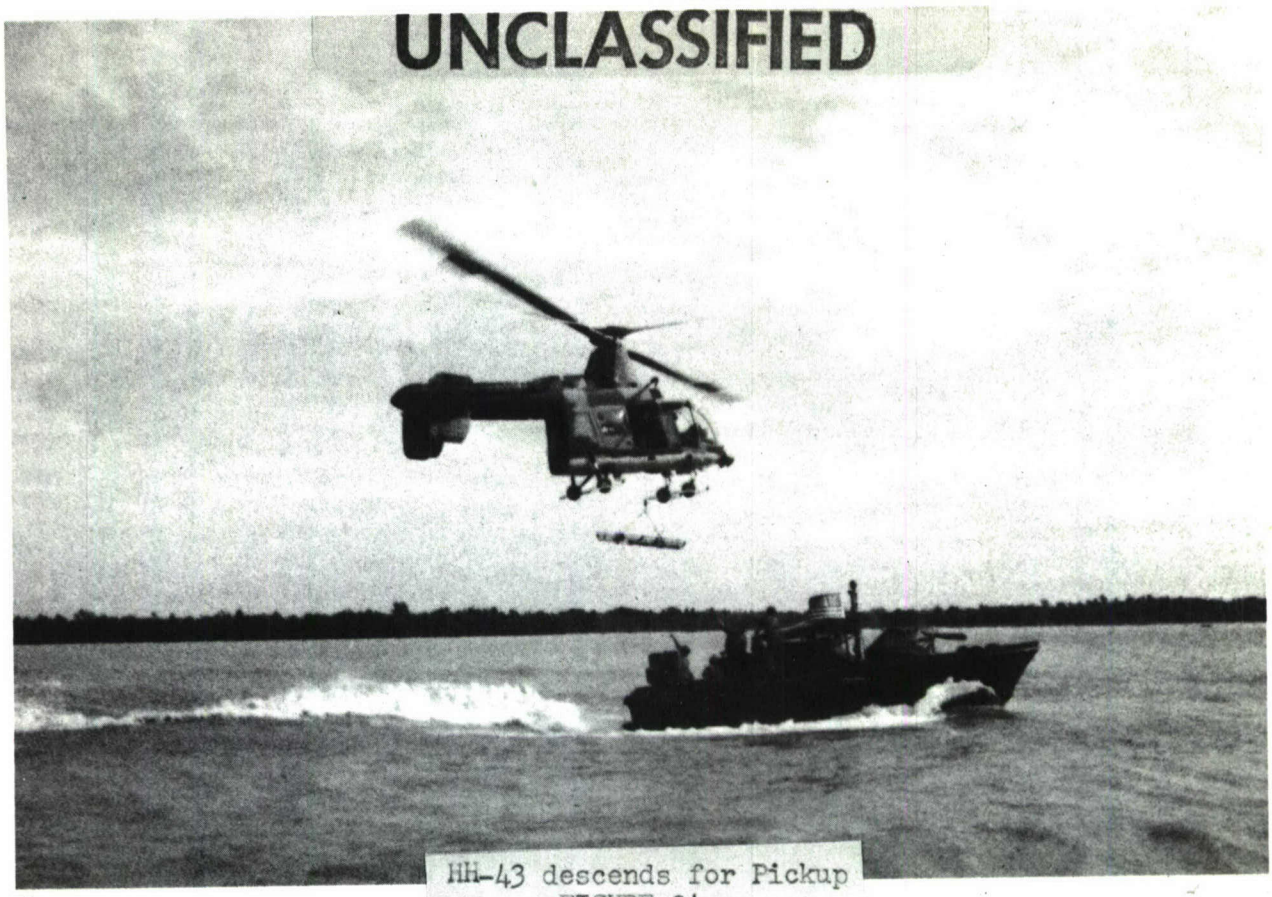
Later the same month, a dramatic rescue of an unusual nature was made of two aircrewmen who had successfully ejected and were in the water northeast of Tiger Island. JG 29 went in to attempt a pickup of the survivors and received intense ground fire from Tiger Island, causing it to crash into the water within 500 meters of the two survivors. The four crewmembers of JG 29 abandoned the aircraft and deployed their life rafts. Heavy ground fire was still coming from the enemy on Tiger Island, so many fast movers were called in to suppress the ground fire, while two A-1Es, Spads 11 and 12, laid down a smoke screen to provide cover for JGs 31 and 33 who moved in and successfully picked up all six survivors.[14/]

While water pickups generally were preferred because of the lower likelihood of enemy fire, this case turned out to be one of the hottest of missions.

There were many simple water pickups that merely involved the removal of sick and injured personnel. Figures 24 and 25 illustrate such a recovery from a River Patrol Boat by an HH-43 Pedro.

While every effort was always made to recover wounded and dying aircrew men, there were times when the decision had to be made to abandon the effort. The following account by Maj. Gerald A. Jones of the 40th ARRS demonstrates the decisions that a recovery pilot often must make.[15/]

> *"I was flying the high Jolly with Call Sign JG 76 on 17 May 1969 when we got the call for a downed pilot. JG 69, the low Jolly, had incurred some damage while refueling and had to return to base (RTFB), so I took over as low Jolly. JG 77 a back-up bird from Udorn had been alerted and was on its way to take over as high Jolly. The Sandy OSC put me in a position some distance away down in a sort of bowl of land. He held me there for over an hour while the area around the downed pilot was sanitized by 32 fast movers and 26 Sandys (A-1Es)--all over a period of several hours of course. I failed to mention that JG 69 had made one attempt to get into the hot area before the air refueling took place and had taken some hits. The Crown C-130 had flown all the way to the area. They had called in the fast movers and had also set up a MIGCAP of F-102 aircraft when some MIGs were sighted near the area. The OSC had contact for a while with the downed pilot, but said that his voice had gotten weaker, and that he had finally lost contact with him. The OSC finally decided to bring me in on a heading of 310°. At that moment the OSC was not completely sure of the pilot's position, but decided to bring me in to see if I could spot him. After arriving in the area we were unable to spot anything that looked like a chute. The marking smoke by the Sandy showed nothing. I decided to make a sharp turn and head out to let them vector me in again--we were receiving many hits at this time, and at that moment I spotted the chute. We had received an earlier report that*



HH-43 descends for Pickup
FIGURE 24

HH-43 lifts injured Sailor off River Patrol Boat
FIGURE 25

he was out of his harness, but I distinctly saw him wedged between some rocks, in harness with something wrapped around him. I hovered over the spot and the PJ went down the penetrator to the pilot, the PJ told me that he was obviously dead and had started to stiffen and that his wounds were numerous. His limbs were twisted and he was thoroughly ensnared in shroud lines, and in his tree lowering devise, plus being tightly wedged in between the rocks. In the PJ's judgment it would take a minimum of 15 minutes to get the body loose. Enemy fire was getting intense so he signaled to be pulled back up. We had been in a hover for 8 minutes. The engineer reported to me "we have him aboard". In my anxiety I reported to the OSC that we had the pilot, but quickly corrected myself when the engineer corrected me. We were vectored out of the hot area flying low and shortly thereafter returned to base. I feel that the decision to abandon the body under the circumstances was a wise one since the danger of getting the crewmembers wounded was imminent. The area was red hot and 15 more minutes could have been deadly. We were airborne a total of 5.8 hours."

There were many other stirring and dramatic SAR missions that are not related here, since the majority of them have been detailed in other published reports. Those presented here were chosen to provide a representative sampling from among the wide spectrum of Search and Rescue activity in SEA.

CHAPTER VIII

OUTLOOK FOR THE FUTURE

The single most important item in a successful recovery was communication with the survivor. Without it, the SARTF often could not locate the survivor with enough precision to safely sanitize the area and complete the recovery. New and more reliable survival radios were being developed to meet this need. In addition, several electronic devices were being developed that would aid the SAR aircraft in finding the survivor. The most desirable of these was an airborne system which would provide both bearing and distance to the survivor and pinpoint a position directly over the survivor. In the dense jungle of SEA, the helicopter crews often failed to establish visual contact with a survivor.[1/]

In concert with this requirement, an item was being developed which could revolutionize SARTF employment--the Night Recovery System (NRS). This system would permit the HH-53C helicopter to perform covert rescue operations at night, or in weather conditions, in permissive or semipermissive areas. It was designed for use in the less densely populated areas. Rescue operations in SEA were greatly limited by the fact that pickups had to be made in daylight and with visual contact with the ground. When performing a rescue mission by helicopter in a remote area, there were no navigational aids to direct the pilot to the downed survivor, there were no approach aids to permit a safe descent over unknown terrain, and most limiting of all, helicopters did not yet have instruments to indicate when the aircraft was hovering motionlessly over the ground. Therefore, the pilot required an undistorted visual reference to the ground to control his hover. The lack of an instrument hover capability

made it extremely hazardous to attempt a rescue at night or under low visibility.

During combat rescue operations, a number of instances were recorded where a downed pilot or crew was contacted or even seen on the ground in good shape and with no hostile forces nearby; then nightfall or weather conditions would cause the rescue effort to be postponed until either light appeared or the weather conditions cleared. In several instances, the survivor was never contacted again. The time delay in effecting the rescue was sufficient to allow the enemy to converge on and capture the aircrewmen. In other cases, wounded men died due to shock or loss of blood.[2/]

Southeast Asia Operational Requirement (SEAOR-114) had been submitted for the development of a night/low visibility recovery system to be incorporated into the SAR helicopters. The development task was given to Sikorsky Aircraft Corporation and was proposed for the HH-53B. This system was to include a number of capabilities: to navigate to the search area and pinpoint the survivor's location; to provide terrain/obstacle avoidance system, which would assure clearance up to 1,000 feet; to program an approach to a high-hover mode (250 feet), and maintain a stable-hover mode over land or water; to permit the direct or indirect visual acquisition of a downed airman at approximately five miles; to furnish visual displays of the survivor's location at both the pilot's and the hoist operator's positions; and to include a means of visually acquiring the survivor without compromising his position.[3/]

At Sikorsky Aircraft, the SEAOR was summarized briefly as requiring:[4/]

- Low-level flight over hostile terrain to avoid radar-directed ground fire during non-visual flight conditions.

- Visual or low-light-level TV augmentation allowing for night search and precise positioning of the aircraft over a point on the terrain below.

- Automatic approach and hovering to aid the pilot during the final phases of the night rescue mission.

After many months of study and development, Sikorsky announced that modification would begin on the HH-53Cs in the summer of 1969. The Night Recovery System was to consist of the following primary systems: 5/

- A Self-Contained Navigation System using an AN/APN-172 Doppler radar and an AN/ASN-73 heading and attitude reference. These basic sensors feed inputs of ground speed, drift angle, and compass information to a digital central computer which calculates and provides display data for present position. Steering information is provided to a selected destination or any of four check points. Present position can be updated with either TACAN information or through the use of search radar cursors.

- A Terrain Following/Avoidance Radar System using an AN/APQ-118 terrain following radar. The terrain radar sensor measures the vertical deviation of the flight path from a preset clearance altitude and provides this signal to the central computer which, in turn, generates a climb or dive signal. This climb/dive signal is implemented through the flight controls during automatic terrain following and displayed as a command signal during the manual terrain following mode. In addition to the basic climb or dive command, the radar provides video information for alternate flight path selection (TC-PPI) and ground map presentations for search or navigation updating.

- The Night Vision System consists of a low-light-level television camera which is mounted on a one axis servoed platform and a direct viewing device located on a swivel mount in the cabin personnel door. The forward looking television system provides the pilot with a 30° field of view of terrain, trees, etc., under light levels down to 1×10^{-3} foot lamberts. Auxiliary covert lighting is provided to increase the quality of the television picture under light conditions down to 5×10^{-5} lamberts. The one axis platform allows the pilot to select a verticle viewing angle consistent with the mission phase. The direct viewing device in the cabin personnel door enables the hoist operator to aid during search and to identify and view the rescuee during the final pickup phase.

- An Automatic Flight Control System consists of a Hover Coupler System used in conjunction with the present HH-53B Flight Control System. Commands for automatic vertical and horizontal steering control originate at the central computer and are implemented through the stick trim circuits. The combined Computer/Automatic Flight Control System provides completely automatic hovering, terrain following, navigation, and controlled descent capability, relieving the pilot of a large number of flight tasks.

A fictional mission was conceived by Sikorsky Aircraft that staggers the imagination; it envisioned one of the most demanding efforts that could ever be performed in an aircraft. The mission is reprinted here to illustrate what might be required in a SAR mission of the future and indeed what could take place when a rescue attempt demanded it.[6/]

"The mission begins at night in the monsoon season, when word arrives that a pilot is down and his approximate position is given. Pilots and para-rescue crewman race to their helicopter. The HH-53C has been fueled and readied during the day. The electronics have been preset for the first flight phase. Up to four initial navigation checkpoints were set into the computer with the morning's knowledge of where raids would be today. Final operational frequencies are checked on all radios. IFF and

'Angel's Voices' are doubled checked.

"The crew enters the helicopter. Pararescue crewmen check their gear. The pilot starts the engines and rotors turning while the copilot makes a last minute check of electronics. All systems are 'Go'. He enters the reported coordinates of the downed pilot's position in the computer. Meanwhile the crew chief has picked up a transfer alignment tool and attaches it to the side of the aircraft. Within seconds the aircraft heading reference has been aligned to within a fifth of a degree. The pilot calls for clearance. The computer is started. (If the HH-53C is orbiting near a raid area, a final position update is coordinated with the orbiting C-130 and entered in the computer. The transfer-align is not used because the heading reference system will be in a 'slaved' rather than 'free gyro' mode.)

"Takeoff. The pilot begins a climb to cruise altitude above cloud level. It's IFR on top all the way. Already the navigation system is accurately tracking the aircraft's position and showing the way to the first checkpoint. At 3,500' altitude, the pilot engages cruise and altitude, ASE modes. The automatic navigation mode is selected. Now the 53C is flying itself--speed, altitude, and heading automatically controlled.

"The pilot and copilot look ahead to the next mission phase. TACAN identification and update are set up for the first checkpoint. Penetration altitude over hostile territory is reconfirmed. Communications provide improved data on the downed pilot's position. The new coordinates are given to the computer. Brief glances by pilot and copilot at their integrated vertical situation displays and at the map plotter confirm normal functioning of all automatic controls. No caution advisory lights are lit. The pilot takes time to re-brief the crew on final mission phases.

"First checkpoint. TACAN station tuned in. Signal looks strong. The copilot pushes the TACAN update button on the computer control panel, and the aircraft's position is automatically updated. Pretty good. One-half hour out and we're less than one mile off. The copilot confirms the position on the map plotter. The second checkpoint is selected. It's close to an enemy radar directed gun site, but we're going faster. As the navigation system begins to bring the aircraft to its new heading automatically, the pilot disengages cruise and altitude hold.

"Now in enemy territory and beyond TACAN range. Time to get down. The pilot selects terrain following on his display. Using the earth contours appearing on the display and his altimeter he brings the helicopter to 200 feet above the ground and levels out. For a few minutes he follows the terrain manually--matching the flight vector to the climb/drive command on the VSD. Satisfied that the system is normal, the pilot engages the automatic terrain following mode. Constant speed is selected since getting in fast is important. Again the aircraft is under fully automatic control--speed and altitude are under command of the terrain following radar; automatic navigation is controlling heading. Time to take a breath and check the progress of the mission. Warning lights will flash and a climb will automatically start if anything goes wrong in the automatic systems.

"Get a new reading on the downed pilot's position. Nothing new available. Check the map plotter. The map shows an enemy concentration of radar weapons just to the left ahead. The pilot selects the constant altitude mode of terrain following--a little slower, but it really hugs the terrain. The vertical display and terrain clearance display show a hill directly ahead. That's where the radar weapons site is. Can avoid that by going around instead of over. The pilot disengages automatic navigation and uses his display to manually guide the aircraft to the right of the hill. The terrain following system holds his altitude. Past the hill and past the enemy concentration. The pilot re-engages automatic navigation and constant speed terrain following--still in a hurry.

"Take a breath and check the displays. Next checkpoint coming up. This will have to be a radar update. The co-pilot switches the radar display to ground map. On the map plotter, the river bend that is the first checkpoint shows up on the horizontal display just ahead and to the right. The copilot sets the horizontal display cursors over the checkpoint. A push of the computer update button, and any accumulated navigation error disappears.

"Past the second checkpoint. The copilot selects the downed pilot's coordinates, and automatic navigation smoothly turns the helicopter to the final outbound leg. Aircraft still under fully automatic control. The pilot reviews the action needed in the final step of the mission. He scans his displays.

Suddenly an advisory light flashes on--the Doppler navigation radar is inoperative, Forget it! The system has already switched automatically to the alternate air data mode--it'll do fine for the rest of the mission. Nice to know all the on-board systems have similar back-ups in case something like this happens. Aircraft still on fully automatic control. Minutes to the downed pilot's position now. Make a communication check with the cover aircraft. They're in voice communication with the downed pilot, but aren't absolutely sure of his position. The copilot checks the UHF/ADF Homer and switches his situation display to the low-light-level television mode. The pilot selects 800' for terrain following--it's easier to search at that altitude, and the overhead clouds are at a 1,000'. The ADF needle swings and then stabilizes. The downed pilot is at one o'clock. The pilot disengages automatic navigation and brings the aircraft to the ADF heading.

"The copilot concentrates on his TV display. Watch it, there's a flash! It's repeating at one-second intervals--that's the downed pilot's strobe light. Although the light flashes brightly on the TV display, its IR cover makes it practically invisible to the naked eye--it shouldn't bring the enemy crashing in. Now the pilot disengages the terrain following mode, starts to reduce altitude, slows down the helicopter, and switches his own display to the TV mode for final approach. The range is correct now. Switch to automatic approach to hover. The TV picture is poor. Too much cloud cover over that quarter-moon. The copilot switches on the IR searchlight to illuminate the terrain and pinpoint the downed pilot's position. Again, since the searchlight is filtered, no light is visible to draw enemy fire.

"The AFCS smoothly and automatically brings the helicopter to a hover, while both pilot and copilot are monitoring the approach on their TV to make sure there are no obstacles in the way. The pararescueman switched on the IR covered hover lights. He advises the pilot that he can see the downed airman through his direct viewing device. With the pilot's permission, the pararescueman takes control of the helicopter. He positions it directly over the downed crewman using his hover trim control. The hoist operator quickly lowers the forest penetrator right to the downed pilot. He spreads the rescue seat slats and gets on for the hoist ride to the helicopter. The hoist operator starts the hoist up as he sees through his direct viewing device that the downed pilot is in the seat. The pararescueman tells the helicopter

pilot that the downed airman is clear of the trees. Gunfire invades the night' They've got spotter scopes! Pull pitch and get out fast. Level off at 300 feet. Engage terrain following. VSD in terrain following mode. At 150 knots it's hard to hit the aircraft. Pararescueman reports downed pilot's aboard--mission accomplished--let's go home.

"37-mm AA fire explodes around the helicopter. Bad luck--right across a hidden radar battery. A round explodes just below the nose. Crew OK. The armor does its job. The alphanumeric altitude and command data disappear from the VSD. Lights flash in the cockpit. The helicopter starts to climb fast. Pilot and copilot quickly scan the lights. Conclusion: the computer's been hit. It's lost. Terrain radar still working though. VSD still shows terrain countours. Action! Stop the automatic climb. No sense getting above the mask of those AA guns again. 2,100 feet should do it. The contour lines still on the VSD and the terrain contours on the radar display provide plenty of information for manual terrain avoidance at this altitude. Even if the VSD goes, complete back-up flight instruments for both the pilot and copilot enable full instrument flight control on the flight director. Proceed with contingency plan.

"Self-contained navigation system gone. Use dead reckoning-ground radar navigation when in range. Head west instead of south. This is the long way around, but at this altitude it's necessary to go around those radar-directed weapon concentrations. Clear of the hot spot now. Climb to 5,000 feet for an easy ride home. Engage altitude hold. Check heading and pull feet off pedals. Engage heading hold. This isn't as good as automatic navigation, but the helicopter will stay right on altitude and heading without absorbing all the pilot's attention. Can make it now without the computer.

"Both pilots take a deep breath. The pilot checks that the copilot has marked the position of that surprise AAA battery on the map plotter. That's an important item for debriefing. The copilot has also switched the horizontal radar display to provide a 30 mile range radar map. He's using the terrain features on the display to maintain a constant check on the route shown on the map plotter, which is now manual. The pilot checks out the radios. UHF inoperative, but HF and FM are OK.

"The extended flying required to avoid those radar concentrations means aerial refueling to get home. Make radio transmission announcing code for contingency plan. Get acknowledgement. Tanker waiting--looking for you--knows your radio frequencies. Rendezvous with tanker. Fill up on fuel--get an updated position fix and head for base. Minutes later the TACAN picks up a ground station. Positive radio navigation available now. Call ahead with ETA and get a weather report. Lousy base weather, so make a standard instrument ILS approach. The pilots park the aircraft. The rescued pilot is fine...the pilots head for Operations and debriefing."

The mission, while heavily dramatized, does illustrate the capability and versatility of the Night Recovery System. Of course, the mission could never be considered as typical--too many mishaps were made to occur to bring all the backup modes into play. It does, however, present a startling potential for saving lives on a 24-hour basis.

An extended delay was encountered in developing the terrain avoidance capability of the NRS. So, the Aerospace Rescue and Recovery Service, in an effort to acquire even a limited capability, suggested that the system, less the terrain avoidance capability, be made available as quickly as possible. This proposal was approved and the system is presently undergoing a two-stage installation. The system, less the terrain avoidance capability, is now designated the Limited Night Recovery System (LNRS); when terrain avoidance is incorporated, the complete system will be called the Full Night Recovery System (FNRS). The LNRS was to be installed on the seven HH-53B helicopters (five in SEA and two at the ARRTC at Eglin AFB). In July 1969, the two HH-53Bs at the ARRTC were being modified with an expected completion date of August 1969, and the five in SEA were to be modified between 1 August 1969 and February 1970. Each

helicopter would require approximately 45 days for modification. The FNRS was to be installed on eight HH-53C helicopters in 1971.[7]

The Night Recovery Systems were to be employed first in a covert manner in areas where little or no immediate opposition exists. This plan was explained by Maj. Robert Smith, Director of Plans, 3d ARRG:[8]

> *"An extremely hostile area would still be prohibitive even with this capability because fighter escort and close air support would not be available to the SAR helicopters. It would, however, permit a SAR effort to continue into darkness or to be executed during the night, thus denying the enemy the chance to organize his forces and converge on and capture a survivor. The modified Buffs will be no more survivable than before as far as hostile fire is concerned."*

There were many other developments in progress that would improve SAR capabilities. Some of the more significant were:[9]

- An airborne ground fire warning device that would provide a cockpit display of hostile ground fire intensity and direction. (SEAOR 4)
- A rescue direction-finding and ranging system that provides multiple acquisition of survivors (SEAOR 46) and operates on four separate UHF channels locating six targets on each channel without ambiguity.
- A program in the communication area which, when completed, would improve the COMM support for SAR operations. SEEK SILENCE was the code name for the Air Force program which would provide air/air and air/ground secure voice capability in SEA. This capability would be provided by installing COMSEC equipment, to be used in conjunction with aircraft and ground radios, and would encrypt normal voice transmissions. SAR requirements were included in the overall 7AF package. 7AF could not provide a system completion date since the aircraft, including SAR aircraft, were to be modified during IRAN; base level modification

of the radios is required; and finally, base installation of the crypto kits (SIC). On 1 Feb 69, 7AF published a SEEK SILENCE OPLAN which outlined procedures and concepts of operation. Limited use by FY/70 is expected.

- A survivor protective [gas] mask for one time use (SEAOR 144) is expected to be available by the summer of 1969. The mask is for use in conjunction with the employment of CS gas during rescue operations.

- A new improved forest penetrator (SEAOR 75) to reduce the possibility of entanglement or injury to a survivor while being hoisted through a thick jungle canopy, was in evaluation as of this writing.

A completely new recovery aircraft was also in the possible future of SAR activity. The conflict in Southeast Asia vividly demonstrated that combat rescue was a highly specialized task, with requirements peculiar to the rescue mission. In June 1967, the Air Force began plans to develop an aircraft system, designed specifically for the combat aircrew recovery role. The aircraft would be required: to have a multi-engine capability and single-engine performance, capable of continued flight at 5,000 feet Mean Sea Level (MSL), with mission payload and one-half mission fuel; to cruise at least 400 knots in mission configuration; to have a radius of action of 500 NM (without refueling) and a ferry range of 2,200 NM; to be capable of hovering for 30 minutes out-of-ground effect at 6,000 feet MSL at mission midpoint; to be able to pick up 1,200 pounds, while maintaining a 20 percent power margin; and to be capable of night and all weather operations. When developed, it will be the first aircraft designed specifically for the recovery role of the Aerospace Rescue and Recovery Service. 10/

CHAPTER IX

CONCLUSION

The dedication and professional competence of the 3d ARRG, as the primary agency of the USAF SAR effort in SEA, is substantiated by statistics compiled during more than four and one-half years of activity. From 1 December 1964 through 30 June 1969, the group saved 2,682 lives. A total of 1,842 were combat saves, where the possibility of death or enemy capture was extremely high. The following statistics depict, by type of rescue aircraft, and by year, the number of aircrew and non-aircrew combat saves for the period of 1 December 1964-30 June 1969.[1/]

BY AIRCRAFT

ACFT	1964-5		1966		1967		1968		1969		TOTAL
	ACR	N/ACR	ACR	N/ACR	ACR	N/ACR	ACR	N/ACR	ACR	N/ACR	
HU-16	24		22		1						47
HH-43	53	42	65	186	68	147	79	92	58	92	882
HH-3	8		92	38	122	68	163	138	48	1	678
HH-53					1		21	79	16	118	235
TOTAL	85	42	179	224	192	215	263	309	122	211	1,842

When a man was in trouble and needed help, the 3d ARRG put forth equal effort without regard to service or nationality. The following statistics depict the number of people rescued by the group as to service. It is interesting to note that there have been more U.S. Army personnel recovered than USAF.[2/]

BY SERVICE

SERVICE	1965		1966		1967		1968		1969		TOTAL
	ACR	N/ACR	ACR	N/ACR	ACR	N/ACR	ACR	N/ACR	ACR	N/ACR	
USAF	47		117	1	99	43	129	12	77	8	533
USN	23	6	29	3	42	55	47	69	11	41	326
USA	11	35	27	169	45	66	80	47	32	29	541
F/Mil	4	1	6	23	2	43	6	45	2	128	260
Civ				10	4	4	1	136		5	160
Other				18		4					22
Total	85	42	179	224	192	215	263	309	122	211	1,842

Innumerable people have been saved from situations other than combat. The seriously ill in ships at sea, in isolated hamlets, and from forward hospitals have been recovered safely. Those wounded in accidental aircraft crashes and by the catastrophies of nature have also been rescued. Even those stranded and isolated by floods and fires have welcomed the sight of USAF helicopters arriving to carry them to safety. The following statistics detail the combat and non-combat record of the 3 ARRGp over the years to show the impressive total of 2,682 persons saved.[3/]

COMBAT/NONCOMBAT SAVES

	1 Dec 64-65	1966	1967	1968	1969	TOTAL
COMBAT	127	403	407	572	333	1,842
NONCOMBAT	39	73	239	344	145	840
TOTAL	166	476	646	916	478	2,682

As evidence of the public interest in USAF SAR, a 25-minute color movie "The Faces of Rescue" is being produced. This film is being done in the same tradition as former films on rescue such as "There Is A Way" and "Alone, Unarmed and Unafraid". The French Film Company, Alliance Productions, is presently in South Vietnam filming "Rescue In Southeast Asia" to be shown on national French television. In September 1968, the National Geographic magazine published a 24-page story entitled "Air Rescue Behind Enemy Lines", in which several dramatic rescues were recounted. In March 1969, Airman magazine presented an article on the "Big Ugly Fat Fellow" referring to the HH-53B/C, the largest rescue helicopter in the inventory.[4/]

As Maj. Carroll Shershun, Information Officer of the 3d ARRG said: "I receive a tremendous number of requests for material on the activity of this group. The interest groups include magazines, newspapers, television companies, military writers, and free-lance writers. Many organizations also desire knowledgeable rescue men to speak at various functions. Acts of courage, while saving human lives, are of interest to everyone, and rightfully so."

There appears to have been a concentrated effort to record for posterity the Search and Rescue activity in Southeast Asia. Perhaps it is due to the fact that when the taking of life is so basic in combat, the saving of lives at the same time, becomes even more meaningful.

While pursuing its mission, the 3d ARRG has received more awards and decorations than any other organization of its size in SEA. The impressive total of 9,131 is detailed here:[5/]

AWARDS AND DECORATIONS

Medal of Honor	1	Airman's Medal	84
Air Force Cross	18	Bronze Star	391
Silver Star	260	Air Medal	5,984
Legion of Merit	7	Air Force Commendation Medal	1,043
Distinguished Flying Cross	1,269	Purple Heart	74
	TOTAL 9,131		

The Group also distinguished itself by receiving such honors as the Silver Anvil Award, the Orville Wright Award, the Cheney Award, and several AVCO Helicopter Heroism Awards.

The 3d ARRG experienced its proudest moment on 14 May 1968, when President Lyndon B. Johnson presented the Medal of Honor to Capt. Gerald O. Young who was previously assigned to the 37th ARRS as an HH-3E Jolly Green Rescue Crew Commander. The presentation marked the first time that a USAF rescue man had received the Nation's highest award. Captain Young received the award for his actions in November 1967 after being shot down on a rescue mission.[6/]

A recommendation for the award of the Presidential Unit Citation to the 3d ARRG was pending in the summer of 1969. During the period covered in the recommendation, 1 July 1967 to 31 January 1969, the 3d ARRG maintained an extremely high level of combat activity, while flying 58,824 sorties and logging 62,893 hours.[7/] Within the narrative of the recommendation, the Chief of Staff of the Air Force, Gen. John P. McConnell, stated: "Aircrews of ARRS have served with special distinction in support of our combat crews in Southeast Asia...

the exemplary performance of their difficult and hazardous tasks represents one of the proudest chapters in Air Force History". In the same narrative, Dr. Harold Brown, former Secretary of the Air Force, stated: "...the extent of the operation, the danger involved, and the dedication on an every day basis month after month--makes these rescue operations something unique in our military history...these men are all heroes...Certainly, the ARRS people deserve their immortality".

There was little doubt that the commitment to the SAR mission in Southeast Asia had proved the worth of combat aircrew recovery forces. When considering the cost and time to train replacements, the value of returning tactical aircrews, downed in hostile territory, to full-time duty could easily be weighed. The immeasurable benefits of aircrew morale and the denial of a source of exploitation to the enemy are intangibles that cannot be precisely calculated. There is strong evidence, however, that the Search and Rescue effort in Southeast Asia played a significant part in increasing overall combat effectiveness. 8/

The praise earned by the men of the Rescue Service is implicit in their code:

CODE OF THE
AEROSPACE RESCUE AND
RECOVERY SERVICE MAN

"It is my duty, as a member of the Aerospace Rescue and Recovery Service, to save life and to aid the injured.

"I will be prepared at all times to perform my assigned duties quickly and efficiently, placing these duties before personal desires and comforts.

"These things I do that others may live."

FOOTNOTES

CHAPTER I

1. (S) Extract, 7AFM 64-1, Hq 7AF, "Organization", Chap 1, pp 1-1 - 1-2, 1 Mar 68, Doc. 1. (Hereafter cited: 7AFM 74-1.) Extract is CONFIDENTIAL.

2. (S) Extract, Hist Rprt, Hq 3d ARRG, Jan-Mar 69, Doc. 2. (Hereafter cited: Hist Rprt, 3d ARRG.)

3. Ibid.

4. Ibid.

5. Ibid.

6. Ibid.

7. (S) Extract, Hist Rprt, Hq 3d ARRG, Apr-Jun 68, pg 21, Doc. 3. Extract is UNCLASSIFIED.

8. (S) Briefing, Lt Col Leslie E. Gamble, Chief, JSARC, 3d ARRG, 7AF, "Senior Officers Briefing", 30 Jan 69, pp 1-7, Doc. 4.

9. (S) Interview, Lt Col Leslie E. Gamble, FR40859, Chief, JSARC, 3d ARRG, 7AF, with Maj James B. Overton, DOAC, 7AF, 3 Jun 69, pp 1-5, Doc. 5. (Hereafter cited: Interview, Chief, JSARC.)

10. (S) Extract, Hist Rprt, 3d ARRG, Hq 7AF, Apr-Jun 68, pp 16, 19, Doc. 6.

11. Ibid.

12. (S) 7AFM 64-1, Doc. 1.

CHAPTER II

1. (S) Extract, 7AFM 64-1, "SARTF", 1 Mar 68, Chap 2, pp 2-1-2-4, Doc. 7.

2. Ibid.

3. (S) Hist Rprt, 3d ARRG, Doc. 2.

(This page is UNCLASSIFIED.)

CHAPTER III

1. (S) Extract, 7AFM 64-1, Hq 7AF, "Rescue Procedures", 1 Mar 68, Chap 3, pp 3-1-3-2, Doc. 8.
2. (S) Interview, Lt Col Chester R. Ratcliffe, FV765840, Comdr, 40th ARRS, 20 May 69, Doc. 9. (Hereafter cited: Ratcliffe Interview.)
3. (S) Hist Rprt, 3d ARRG, Doc. 2.
4. Ibid.
5. (S) Extract, 7AFM 64-1, SAR, Hq 7AF, 1 Mar 68, pp 3-3-3-6, Doc. 10.
6. Ibid.
7. Ibid.

CHAPTER IV

1. (U) Rprt, Form 3, 3d ARRG, "ARRS Combat Saves-SEA", 9 Jun 69, Doc. 11.
2. (U) Guide Book, ARRTC, ARRS, Eglin AFB, Fla., "SATS Student Study Guide and Work Book, HH-53B", Feb 68, Doc. 12.
3. (U) Interview, Maj John E. Duffy, FV3040170, Instructor HH-53, ARRTC, Eglin AFB, Fla., 11 Apr 69, Doc. 13. (Hereafter cited: Duffy Interview.)
4. (S) Interview, Maj Charles Trapp, Jr., FR57249, Comdr, Det 5, 38th ARRS, Udorn AB, Thailand, 24 May 69, Doc. 14.
5. (S) Interview, Maj Lester B. Langston, FR71263, Pedro Pilot and Operations Officer, Det 5, 38th ARRS, Udorn AB, Thailand, 24 May 69, Doc. 15.
6. (U) Duffy Interview, Doc. 13.
7. (S) Ratcliffe Interview, Doc. 9.
8. Ibid.
9. (S) Interview, Capt Art Smith, FV3102343, HH-53 RCC, 40th ARRS, Udorn AB, Thailand, 21 May 69, Doc. 16.
10. Ibid.
11. (S) Extract, Hist Rprt, 40th ARRS, "History of the 40th ARRS, 31 Oct 68 31 Dec 68, Chap II, pp 5-6; Chap III, pp 10-12, Doc. 17.

(S) Hist Rprt, 3d ARRG, Doc. 2.
(S) Ratcliffe Interview, Doc. 9.
(S) Extract, 7AFM 64-1, Hq 7AF, "Helicopter Procedures", 1 Mar 68, Chap 4, pp 4-1 - 4-9, Doc. 18.
(U) Pamphlet, ARRTC, ARRS, Eglin AFB, Fla., "HH-53B Pararescue Technician and Job and Course Training Standards, Feb 68, Doc. 19.

12. Ibid.

13. Ibid.

14. (S) Interview, Maj Gerald A. Jones, FV3037665, 40th ARRS, "Mission in Nov 68", 24 May 69, Doc. 20.

15. (C) Ltr, Maj Gerald A. Jones, RCC, 40th ARRS, to Operations Officer and Comdr, 3d ARRG, JSARC, subj: "Mission Narrative Rprt (#02-03-066-8314)", 12 Nov 68, w/1 Atch;
(S) Atch 1, Completed Form, 3d ARRG, Battle Damage Rprt, undated, Doc. 21.

16. (U) Extract, Article, National Geographic, "Air Rescue Behind Enemy Lines" by Howard Sochurek, Sep 68, Doc. 22.

17. (S) Flip Chart Personnel Briefing, Comdr, 3d ARRG to Maj James B. Overton, Hq 7AF, DOAC.

CHAPTER V

1. (S) Hist Rprt, 3d ARRG, Doc. 2.

2. (S) Extract, 7AFM 64-1, Hq 7AF, "RESCORT Procedures", 1 Mar 68, Chap 5, pp 5-1 - 5-2, Doc. 23.

3. (S) Working Paper 69/36, Hq 7AF, DOA, Capt Jean-Pierre Amor, "Sanitization of AAA Threat Areas during SAR Efforts", 1 Jun 69, Doc. 24. (Hereafter cited: DOA Working Paper 69/36.)

4. Ibid.

5. Ibid.

6. Ibid.

7. (SNF/AFEO) Extract Plan, Hq 7AF, "Combat Aircrew Recovery, Annex H, FY 71, 7AF Force Improvement Plan," Nov 68, pp H-1 - H-17, Doc. 25.

8. (S) Rprt, Comdr, 3d ARRG to Hq ASI (ASD-1R), Maxwell AFB, Ala., subj: Project CORONA HARVEST End of Tour Rprt, 18 Jun 69, Doc. 26. (Hereafter cited: CORONA HARVEST End of Tour Rprt.)

9. (S) Extract, Unit Hist Rprt, 6th SOS, Maj Glenn L. Robertson, 1 Jan - 31 Mar 69, pp 14-19, Doc. 27. (Hereafter cited: Hist Rprt, 6th SOS.)

10. (S) Interview, Chief, JSARC, Doc. 5.

11. (S) Hist Rprt, 6th SOS, Doc. 27.

12. Ibid.

CHAPTER VI

1. (S) CORONA HARVEST End of Tour Rprt, Doc. 26.

2. (S) Extract, 7AFM 64-1 (C1), "Composition, Execution, and Control of SAR Support Forces", 12 Oct 68, pp 6-1 - 6-4, Doc. 28.

3. Ibid.

4. Ibid.

5. Ibid.

6. Ibid.

7. Ibid.

8. (S) DOA Working Paper 69/36, Doc. 24.

9. Ibid.

10. Ibid.

11. Ibid.

12. Ibid.

13. Ibid.

14. Ibid.

15. Ibid.

CHAPTER VII

1. (S) Briefing, Comdr, 3d ARRG, "SAR Briefing for General Brooks", Mar 69, Doc. 29. (Hereafter cited: General Brooks Briefing.)

2. Ibid.

3. Ibid.

4. Ibid.

5. (S) Briefing, Chief JSARC, for Maj James B. Overton, 7AF, DOAC, 12 Jun 69.

6. (S) General Brooks Briefing, Doc. 29.

7. (S) Msg, Acting Dep Dir, 3d ARRG, Hq 7AF to 8th TFW, DO, Ubon RTAFB, Thailand, subj: Rescue Mission 3-3-037-14 Jun 69 (U), 140107 Jun 69, Doc. 30.

8. Ibid.

9. (S) Extract, Hist Rprt, 39th ARRS, Oct - Dec 68, pg 8, Doc. 31.

10. (C) Rprt, 3d ARRG (JSARC), subj: Mission Narrative Rprt, Nr 2-3-003-14 Jan 69 (U), 27 Apr 69, Doc. 32.

11. (S) Mission Narrative Rprt, Nr 2-3-024-29 Mar 69, 31 Mar 69, Doc. 33.

12. (S) Rprt, 3d ARRG (JSARC), subj: Mission Narrative Rprt, Nr 2-3-022, 9 Apr 69 (U), 5 Apr 69, Doc. 34.

13. (S) Extract, Hist Rprt, 39th ARRS, Oct - Dec 68, pg 8, Doc. 31.

14. Ibid.

15. (S) Interview, Maj Gerald A Jones, FV3037665, 40th ARRS, May 69, Doc. 35;
(S) Rprt, 3d ARRG (JSARC), subj: Mission Narrative Rprt, Nr 2-3-034-17 May 69 (U), 19 May 69, Doc. 36.

CHAPTER VIII

1. (S) CORONA HARVEST End of Tour Rprt, Doc. 26.

2. (S) Extract, Hist Rprt, 3d ARRG, "Operations, JSARC, Training, and Safety", Oct - Dec 68, Chap XI, pp 14-18; 22-23; 30-37, Doc. 37. (Hereafter cited: Operations, Hist Rprt, 3d ARRG.);
(S) Rprt, Maj Robert Smith, Chief, Plans, 3d ARRG, "Night Recovery System (SEAOR 114)", 28 Jun 69, Doc. 38. (Hereafter cited: Major Smith Rprt.)

3. Ibid.

4. (C) Rprt, Sikorsky Acft Div, Stratford, Conn., "HH-53C Night Rescue System" (U), undated, Doc. 39.

5. Ibid.

6. Ibid.

7. (S) Major Smith Rprt, Doc. 38.

8. (S) Operations, Hist Rprt, 3d ARRG, Doc. 37;
(S) Major Smith Rprt, Doc. 38.

9. Ibid.

10. Ibid.

CHAPTER IX

1. (U) Rprt, ARRS Combat Saves - SEA, 30 Jun 69, Doc. 40.

2. Ibid.

3. Ibid.

4. (S) General Brooks Briefing, Doc. 29.

5. (S) Vugraph Briefing, 3d ARRG, Jun 69.

6. (S) Hist Rprt, 3d ARRG, Doc. 2.

7. (U) Rprt Summary, 3d ARRG, "Summary of Recommendation for Award of the Presidential Unit Citation to the 3d ARRG, USAF," undated, Doc. 41.

8. (SNF/AFEO) Annex H, FY 71 7AF Improvement Plan, Doc. 25.

GLOSSARY

AA	Antiaircraft
AAA	Antiaircraft Artillery
AC	Aircraft Commander
ACR	Aircrew Recovery
ADF	Automatic Direction Finder
AFCS	Automatic Flight Control System
AMC	Airborne Mission Commander
AR	Air Refueling
ARRG	Aerospace Rescue and Recovery Group
ARRS	Aerospace Rescue and Recovery Squadron
ARRTC	Aerospace Rescue and Recovery Training Center
Buff	Big Ugly Fat Fellow
CAP	Combat Air Patrol
CBU	Cluster Bomb Unit
CINCPAC	Commander-in-Chief, Pacific Command
COMSEC	Communications Security
CRC	Combat Reporting Center
DASC	Direct Air Support Center
Det	Detachment
DMZ	Demilitarized Zone
DRV	Democratic Republic of Vietnam (North Vietnam)
DSR	Director of Search and Rescue
ECM	Electronic Countermeasure
ETE	Estimated Time En Route
EXCOM	Extended Communications
FAC	Forward Air Controller
FIR	Flight Information Region
FM	Frequency Modulation
FNRS	Full Night Recovery System
FOL	Forward Operating Location
Ft	Feet
HF	High Frequency
IFF	Identification Friend or Foe
IR	Infrared
IRAN	Inspection and Repair as Necessary
JG	Jolly Green
JSARC	Joint Search and Rescue Center
Kt	Knot

Lb	Pound
LBR	Local Base Rescue
LNRS	Limited Night Recovery System
MAC	Military Airlift Command
MSL	Mean Sea Level
mm	millimeter
NCO	Noncommissioned Officer
NKP	Nakhon Phanom
NM	Nautical Mile
NRS	Night Recovery System
OL	Operating Location
OPlan	Operations Plan
OSC	On-the-Scene Commander
PE	Pony Express
PJ	Pararescueman
PRECOM	Preliminary Communications
PROVOST	Priority Research Objective Vietnam Operational Support
RCC	Rescue Coordination Center; Rescue Crew Commander
Recon	Reconnaissance
RESCAP	Rescue Combat Air Patrol
RESCOR	Rescue Escort
RTAF	Royal Thai Air Force Base
RVN	Republic of Vietnam
SA/SW	Small Arms/Automatic Weapons
SAM	Surface-to-Air Missile
SAR	Search and Rescue
SARTF	Search and Rescue Task Force
SEA	Southeast Asia
SEAOR	Southeast Asia Operational Requirement
SOS	Special Operations Squadron
SOW	Special Operations Wing
SVN	South Vietnam
TACAN	Tactical Air Navigation
TACC	Tactical Air Control Center
UHF	Ultra High Frequency
VHF	Very High Frequency
VSD	Vertical Situation Display
WP	White Phosphorous

[redacted]

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